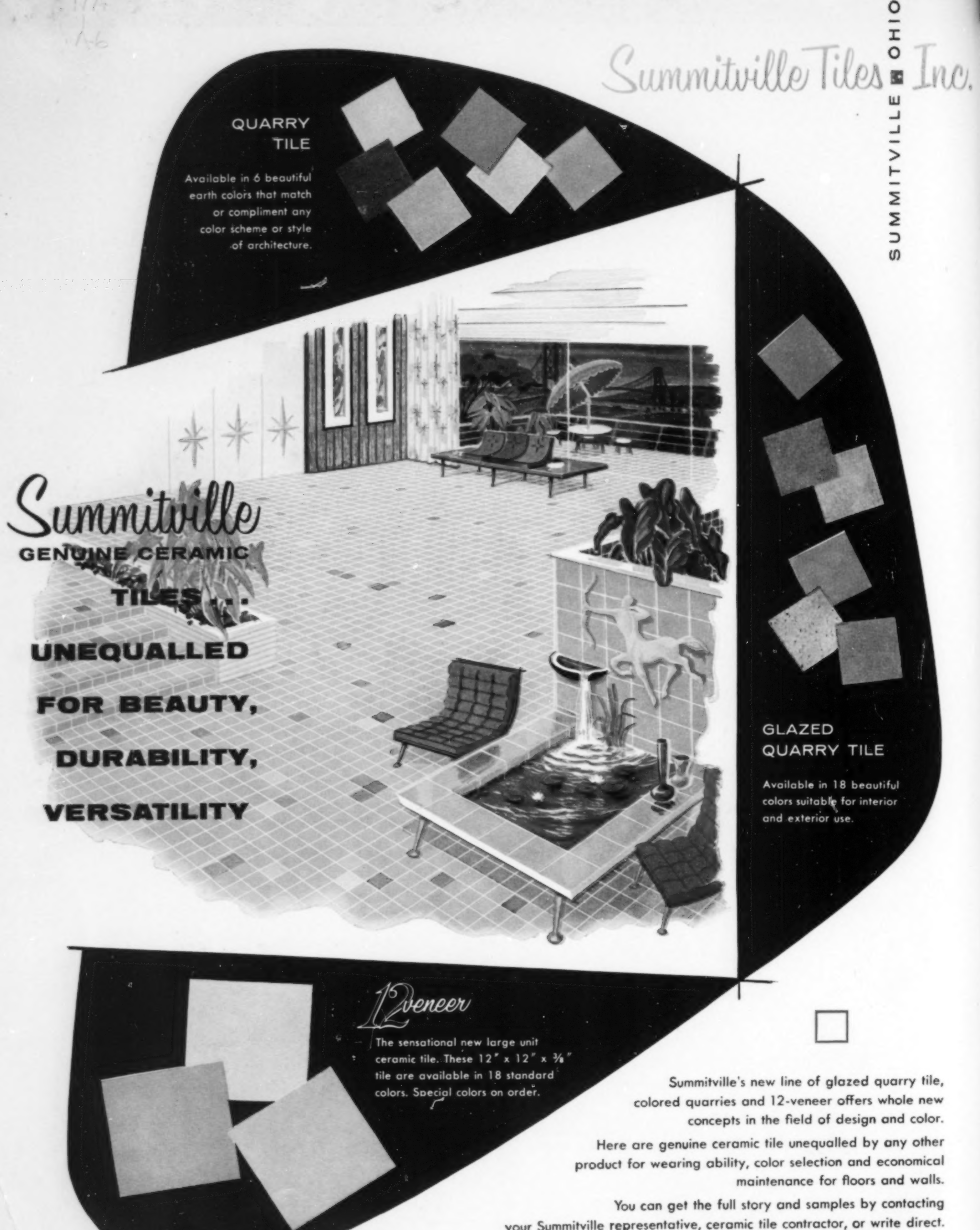
Architectural Forum / the magazine of building / January 1958

FORUM



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EDITORIAL

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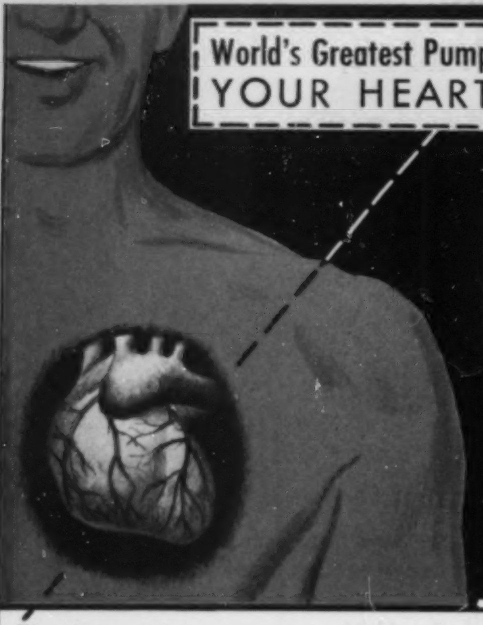

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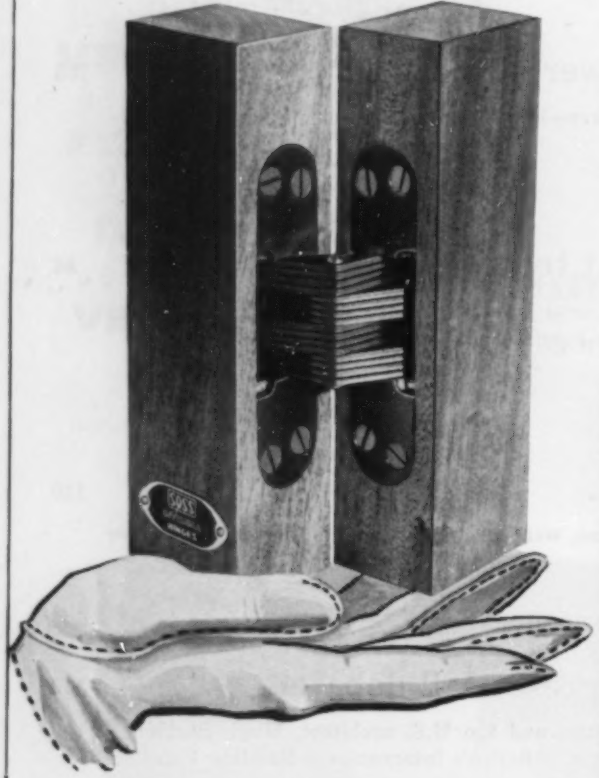

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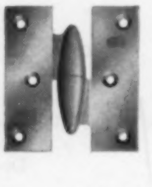

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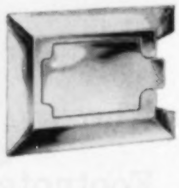

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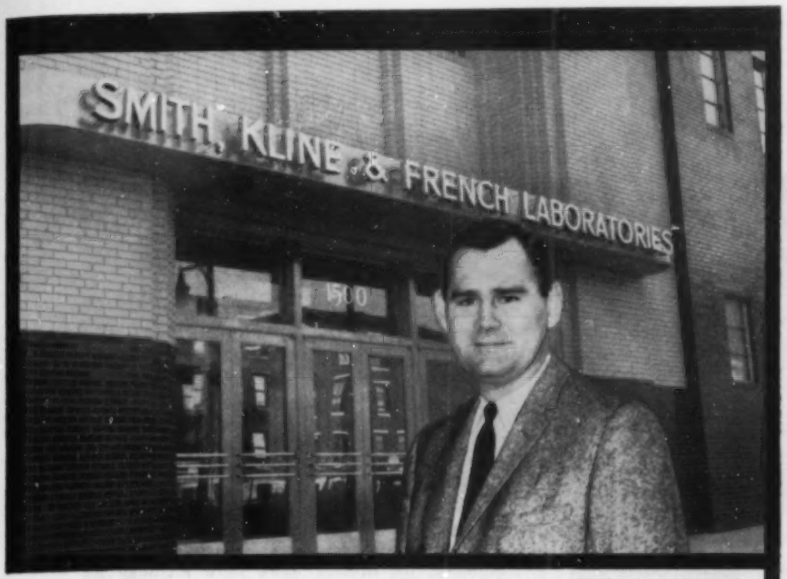

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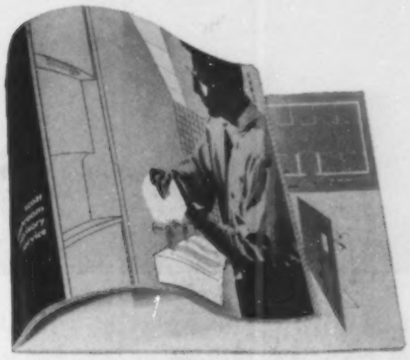
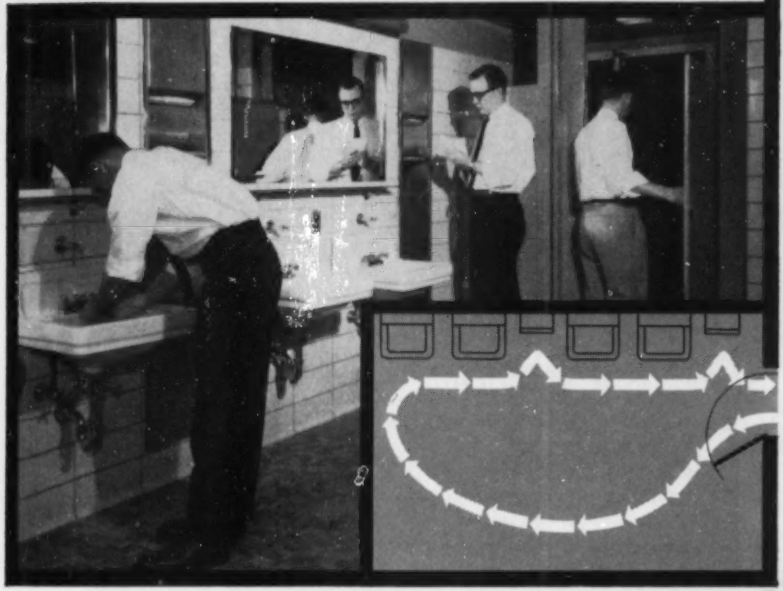
Get Scott's 14-minute film, too. It shows many quick, inexpensive changes you can make *now* to increase efficiency and cut costs!





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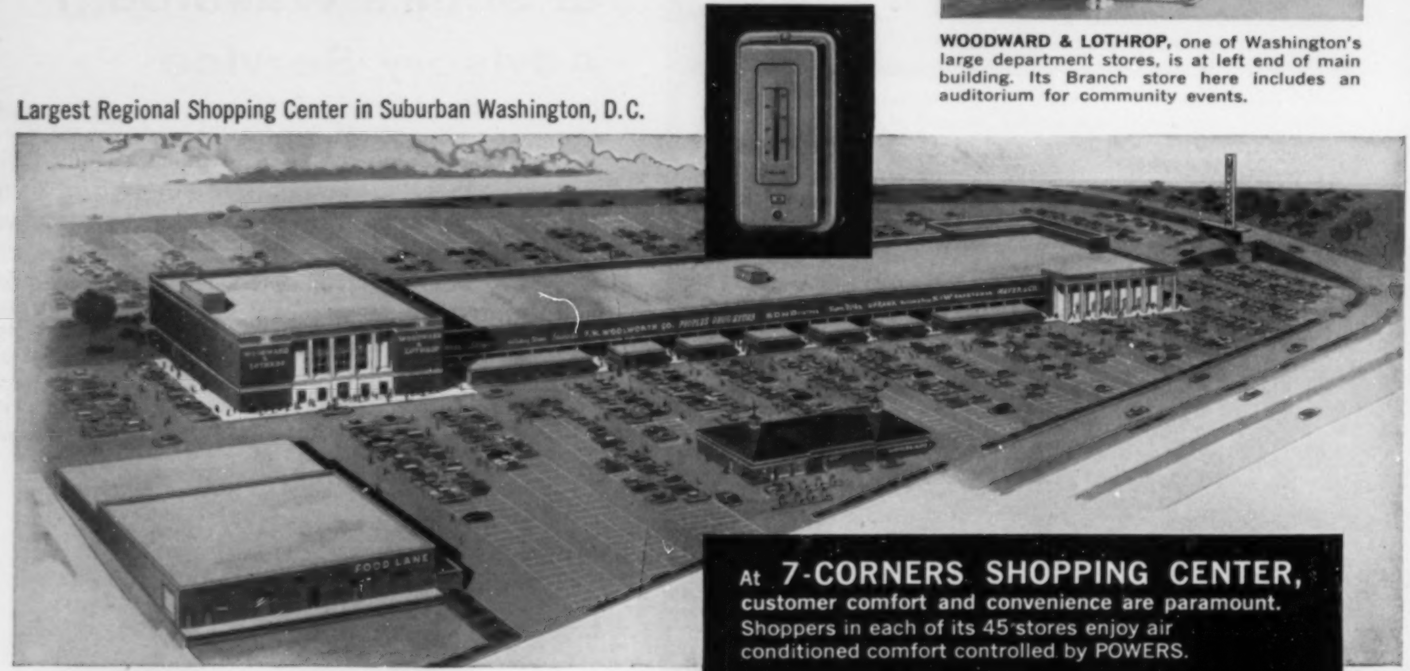
POWERS AIR CONDITIONING CONTROL helps make sales

...in leading shopping centers and stores

SILVERWARE

WOODWARD & LOTHROP, one of Washington's large department stores, is at left end of main building. Its Branch store here includes an auditorium for community events.

Largest Regional Shopping Center in Suburban Washington, D.C.



At 7-CORNERS SHOPPING CENTER, customer comfort and convenience are paramount. Shoppers in each of its 45 stores enjoy air conditioned comfort controlled by POWERS.

Owners: **Garfield I. Kass and Irving D. Berger**
Designed and constructed under the direction of
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Consulting Engineers: **Kluckhuhn, Cobb and McDavid**
Mechanical Contractor: **R. M. Thornton, Inc.,**
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b) Condenser water for entire shopping center is processed in a 3000 ton Cooling Tower built under the Food Lane Super Market. This space also serves as a Retention Basin for storm water and permits use of rain water for condenser cooling for all refrigeration.

c) Conventional Powers Control system regulates central fan systems and refrigeration compressors.

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Macy's, Roosevelt Field Shopping Center and Kansas City, Mo.
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Nieman - Marcus Co., Dallas, Texas
Rich's, Atlanta, Georgia
Sakowitz Bros., Houston, Texas
Saks Fifth Avenue, New York - White Plains
Sears, "Worlds largest store", many large stores in U.S.A. and Latin America
John Wanamaker Stores in Wynnewood, Pa., Baederwood, Pa., Wilmington, Del.

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7 CORNERS
SHOPPING CENTER

Sign Flashes Weather Signals and Time

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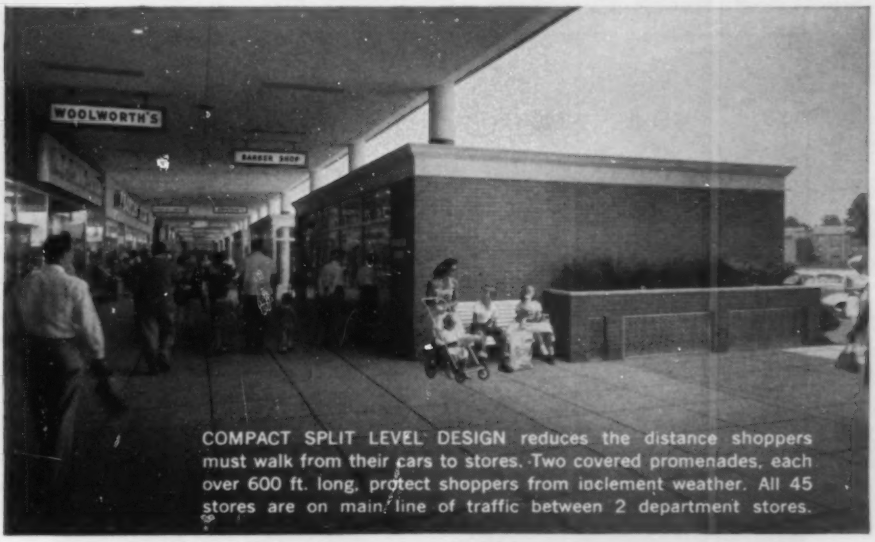
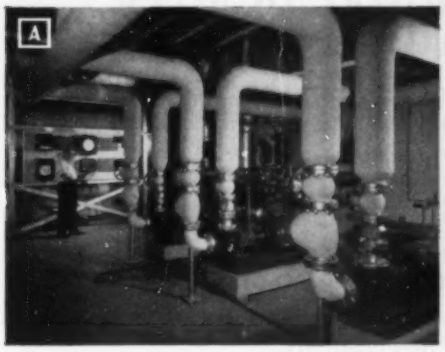
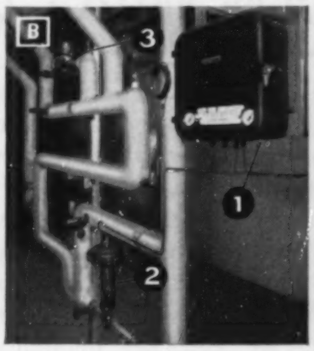


COMPACT SPLIT LEVEL DESIGN reduces the distance shoppers must walk from their cars to stores. Two covered promenades, each over 600 ft. long, protect shoppers from inclement weather. All 45 stores are on main line of traffic between 2 department stores.

Below: **POWERS BTU Metering Control for Each Store.** Photo A shows instrument panel with Powers circulating pump control for high temperature forced hot water heating. Powers control automatically starts and stops the pumps as the load changes. Photos B & C show Powers control employed for BTU heat meter service. B for small stores and C for larger stores.

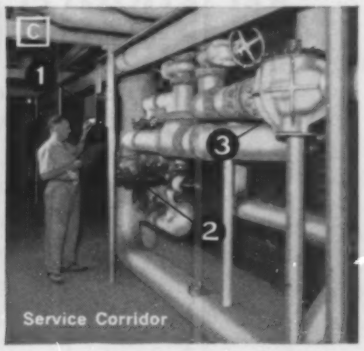




(1) Powers Indicating Heat Meter.

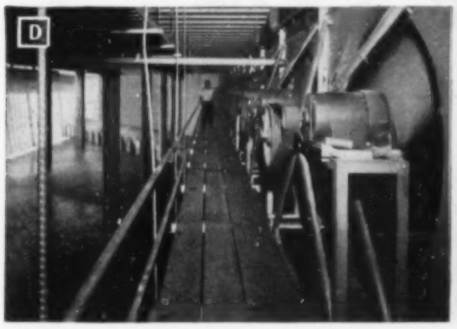
(2) Powers Flowrite Control Valves.

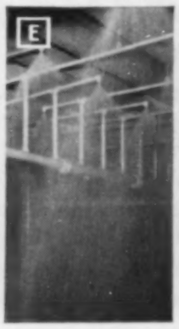
(3) Registering Water Meter.

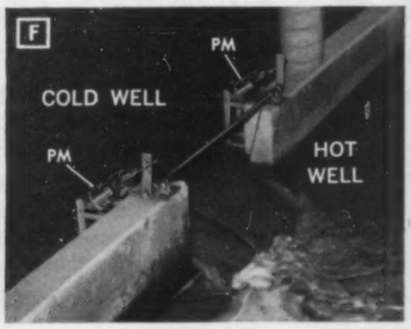


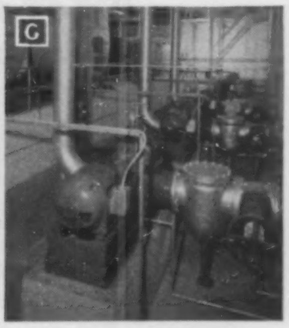
Service Corridor

Below: **Cooling Tower under Food Lane Supermarket:** Photo D shows air intake, portion of retention basin and bank of fans; E shows water sprays; F shows one of two by-pass gates thermostatically controlled by four 6" POWERSTROKE pneumatically operated motors PM; G shows circulating pumps supplying condenser cooling water to air conditioning units throughout the Shopping Center.









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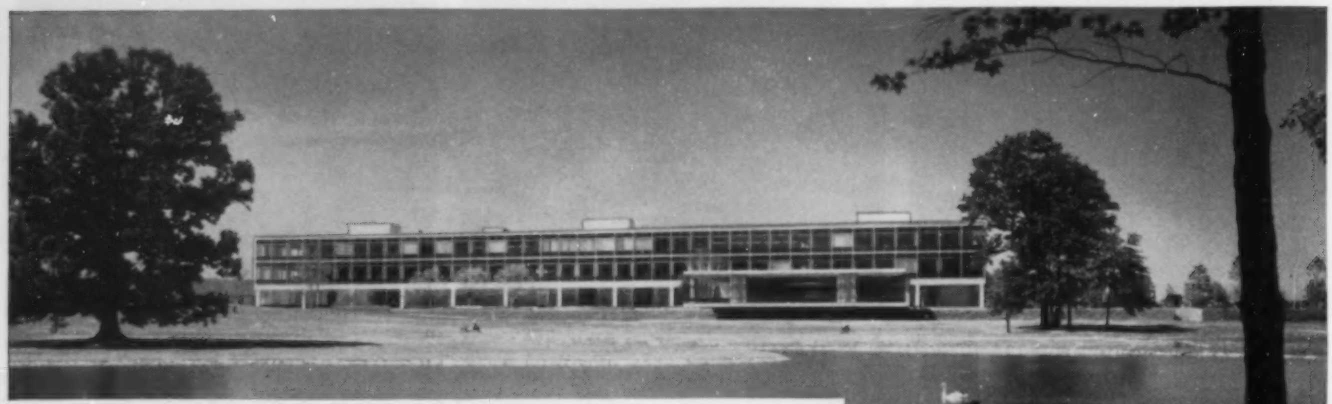
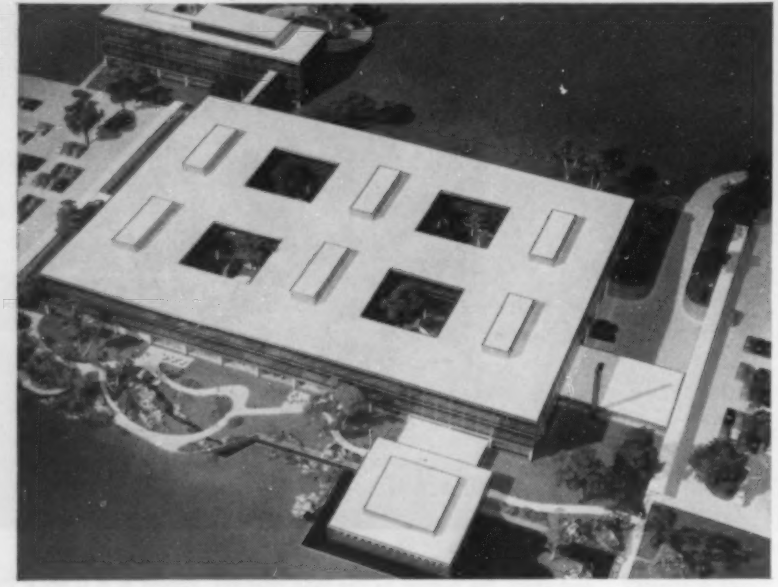


Already chosen by the American Institute of Architects as "One of the Ten Buildings in America's Future"

Photos © EZRA STOLLER



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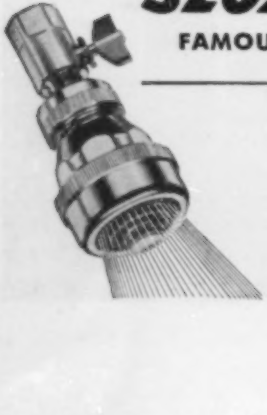

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FHA studying "no-cash-but-no-windfall" plan to encourage the production of rental housing

The Eisenhower administration may ask Congress to enact a new, "no-cash-but-no-windfall" rental housing program. That description could be applied to a plan FHA officials were considering last month in the new housing legislation recommendations they were preparing for the reconvened Congress. FHA Commissioner Norman Mason gave the first hint that major liberalization of FHA rental construction rules was being considered at a press conference in November at the Chicago convention of the National Association of Real Estate Boards (FORUM, Dec. '57). Now more details have leaked out.

Possible changes contemplate FHA-insured apartment mortgages for up to 95 per cent of current construction costs (instead of the present 90 per cent of estimated *value* as a long-term investment) and would allow builder-owners a 5 per cent construction profit —so in effect a builder would not have to invest any cash in a project.

Except for one important difference, this would virtually duplicate the famous Section "608" program, with mortgages for 90 per cent of replacement costs, that produced such a large volume of rental housing in the first years after World War II. This was the program that later was denounced for having yielded many builders large cash "windfall" profits through mortgage loans that actually exceeded total building costs. The proposed "mortgaging-out" program would be subject to "cost certification" rules, to insure that total mortgage proceeds could never produce a cash surplus over total costs. FHA had no such chaste cost certification rules in effect during the "608" boom. (Some cynical home-building spokesmen refused to believe these FHA reports. From recent experience, they insist that FHA would never allow a builder to "mortgage out," no matter what the law or even FHA's own regulations provided.)

Among the reasons for the proposed changes, according to Washington observers, are increasing consumer resistance to high prices for new houses, and scarcity of suitable land for single-family home developments within commuting distance of large cities.

Another trial balloon sent up by Washington officials last month involved a plan for FHA insurance on tax-exempt local debentures to finance "middle-income" housing erected by limited-dividend corporations. Low (tax-exempt) interest rates on such debentures, coupled with limited profits, it is claimed, would help provide middle-income housing without resorting to subsidization or further public housing. A roughly similar plan based on federal instead of local debentures is being advocated by Senator Joseph Clark (D, Pa.).

At least one FHA rental housing program seems slated for extinction, however. According to present information, the Defense Dept. wants no more of the FHA Title VIII or so-called Capehart Act program. Instead it proposes a special housing corporation that could borrow mortgage money against a pledge of officers' quarters allowances or other funds.

PUBLIC HOUSING

Washington getting set to cancel stalled jobs

Steady whittling down of the federal public housing program took a new form last month.

Public Housing Administration regional directors throughout the country were ordered to make a prompt survey of all stalled projects in an obvious step toward ultimate cancellation of many moribund jobs that are included in the national backlog of 80,000 authorized-but-unbuilt units. For the past four years Congress has limited new projects to 35,000 units a year. On that basis, the backlog represents more than two full years' authorizations.

Washington PHA headquarters sent regional directors five criteria for officially classifying any project as "inactive." It also ordered regional directors to notify local authorities immediately that from now on no further preliminary loans or planning advances will be approved for "inactive" projects. This was seen as paving the way for formal federal cancellation of any projects that do not show promise of getting started within a reasonable time. Canceled units that had been authorized under expired legislation could not be re-allocated, and would represent a permanent reduction in the total units eligible for subsidy.

The biggest unanswered question: will Washington be able to recover its preliminary loans and advances if the federal agency cancels a contract? It has been able to go into court and do so when local agencies have abrogated project agreements, but PHA spokesmen are not sure yet how they may fare in the reverse situation. Up to now PHA has never canceled a project.

The Eisenhower administration is also expected to ask Congress this year to extend two overlapping subprograms of 35,000 public housing units each. One of these subprograms runs to June 30 of this year, and the other to June 30, 1959. Altogether only 4,000 of the combined 70,000 units had been put under contract with local housing authorities last month, so it would be proposed that each of these subprograms be extended by one extra year. This would stretch these 70,000 units over a three-year period, and the administration would stick to its earlier decision to seek no new or net increase in authorizations in this year's housing legislation (FORUM, Oct. '57).

URBAN RENEWAL

Cutbacks in federal funds opposed by mayors

Urban renewal and other federal programs that help cities should not be sacrificed to provide the funds needed for expanded national defense and missile development programs. That was the principal theme at the San Francisco convention of the American Municipal Association last month, which was attended by more than 1,000 mayors and other city officials from all parts of the country.

In opposing proposals to reduce federal renewal authorizations below a rate of $250 million a year, the convention adopted a resolution recommending $500 million a year for renewal and slum clearance, and another that proposed sending a delegation to the White House to put city officials' views before President Eisenhower before he makes his final budget decisions for the next fiscal year.

The convention also: 1) proposed a federal atom shelter construction program for urban areas; 2) requested an FHA program to facilitate middle-income rental housing construction in cities that would be as effective as the FHA program for stimulating suburban home building, and 3) asked the federal government to establish a multimillion dollar lending agency to aid private mass transit companies.

One of the convention highlights was a challenging talk by housing and planning expert Catherine Bauer, a member of the department of city and regional planning at the University of California, Berkeley, and wife of William Wurster, dean of the university's School of Architecture there. "Mayors should constantly bear in mind," said Miss Bauer, "that there is no longer any practical necessity for big, crowded city centers"—because Americans now make too much money and have too much spare time to live in a crowded, dreary city. Consequently, glamour is now the key to the survival of cities, she declared, and, inasmuch as planners can seldom provide that, the time has come for mayors to take the initiative with pioneering political leadership that will increase, dramatize, and sell the qualities of "amenity, urbanity, distinction, excitement, fun and good old-fashioned beauty" that make their cities live.

MARILYN SILVERSTONE

UNESCO'S NEW PARIS HOME

The headquarters now nearing completion provides the southwestern section of Paris with a gracefully sweeping facade of glass and concrete that makes the building appear smaller than it really is. Architects: Marcel Breuer, Bernard Zehrfuss, and Engineer Pier Luigi Nervi.

Snags halt two big urban renewal jobs

San Francisco and New York redevelopment officials set to work last month to correct technical defects that caused federal officials to withhold complete approval for several of their projects.

▸ San Francisco's present plans for redeveloping an area south of Market Street were temporarily rejected as inadequate by the regional Urban Renewal Administration office. Proposed razing of blighted buildings covering only seven blocks within a much larger slum district was termed "not logical" by the URA office, which also asked why the boundary of the proposed project had not been extended all the way to a freeway that would be a "natural planning boundary."

▸ New York City's Committee on Slum Clearance prepared to ask for local real estate tax exemption on a prospective apartment project that it originally scheduled for redevelopment subject to full realty taxes. Through tax concessions, the Slum Clearance Committee hoped to reduce rents to a level that would win FHA approval and overcome that agency's refusal to insure a mortgage on the grounds that this particular project would not be a safe long-term investment at the proposed $38 to $40 a room rents. Also in New York, the city formally approved the huge $205 million Lincoln Square redevelopment, and was immediately sued by objectors who claimed the proposed resale of part of the project land to a sectarian organization—Fordham University—would be unconstitutional. In approving the project, the Board of Estimate refused to sanction a plan to purchase the so-called Kennedy Building in the redevelopment area for a negotiated price of $2.5 million (FORUM, Oct. '57) and ordered its acquisition by condemnation procedures.

LAW

N.Y. City Council passes anti-bias housing bill

The New York City Council took what it termed a "historic step" last month when, by a 20-to-1 vote, it approved a bill banning discrimination on the basis of race, color, or creed in the sale or leasing of privately owned multifamily housing. The new measure, applying only to residences housing three or more families, will affect about 1,787,000 dwelling units currently housing over 5 million persons. It is still subject to passage by the city Board of Estimate and signature by Mayor Robert Wagner, both of which are expected without difficulty. As passed by the City Council, it becomes effective on April 1.

New York's action is the first attempt in the nation to legislate against discrimination in privately owned housing that has no government subsidy or aid whatever, either in the form of tax benefits, lower land prices, or federal mortgage insurance.

The city bill has been the subject of violent opinions since it was first proposed last May. It was supported by Mayor Wagner and was sponsored by Councilmen Earl Brown and Joseph T. Sharkey, both Democrats, and Stanley M. Isaacs, a Republican-Liberal. Quick to oppose the bill were all five real estate boards in the city, some builders' groups, and a large number of vociferous landlords. The issues have been relatively clear-cut: supporters cite the damaging effects of discrimination on the city's physical and moral health, and particularly the dangers that segregation in housing raises for schools and other public facilities. Opponents claim the law violates the right of private property and will be judged unconstitutional.

Under the provisions of the bill, a complainant files first with a Commission on Intergroup Relations which will try to settle the grievance by mediation. If that fails, it is passed on to a three-man Fair Housing Practices Board, selected by the mayor. If this board finds that discrimination has been practiced, it can direct the City's Corporation Counsel to seek an injunction in Supreme Court. Finally, if the court so rules, the owner could be compelled to rent or sell his property, or else face fine or imprisonment for contempt of court.

PUBLIC BUILDING

Interest in federal lease-purchase program reviving as GSA accepts 4.74 to 5 per cent financing offers

The federal government's long-neglected lease-purchase program under which private investors erect and finance public buildings showed signs of staging a rapid recovery last month. The General Services Administration received and accepted offers for the financing of five projects to cost a total of $22.2 million, and then promptly advertised for financing to cover another 13 projects to cost another $22.3 million.

Under the lease-purchase system, the federal government is virtually an installment purchaser. It agrees to rent for a period of from 10 to 25 years a building erected to the government's own architectural requirements and built under government supervision. It also agrees to pay a rent calculated to pay the private builders interest and complete amortization of the cost of the structure during the specified lease period, plus a nominal operating or ownership profit. Usually the lease provides for the government itself to operate and maintain the building, and the owner is scarcely more than a passive investor. As soon as the lease expires he must give the building to the government.

The main reason the government decided to go in for lease-purchase construction was that under this system Congress does not have to make big construction appropriations. Congress can make much smaller year-to-year rent appropriations; thus it does not have to borrow large sums for a building program that would markedly boost the national debt.

Congress first authorized a lease-purchase program in 1954. Then it took about two years for GSA to develop all its administrative rules, award design contracts for specific projects to local private architectural offices, and obtain completed designs. Only one of its projects was contracted for by the end of 1956. By that time tight money and GSA's resistance to rising interest rates brought the infant program to a virtual standstill. The Budget Bureau decreed that financing contracts could not be made on the basis of yield or interest-equivalent over 4 per cent.

Unable to move any projects at that price, GSA made a virtue of necessity and last February announced it was suspending the program "to avoid aggravating inflationary pressures . . . in the construction industry" (FORUM, March '57). Two months ago, GSA lifted this suspension, and, most significantly, the Budget Bureau authorized financing at whatever rates the GSA judged "reasonable."

In sharp contrast to the former 4 per cent ceiling were the rates on the first five financing contracts approved by GSA last month. The Bankers Life Co. of Des Moines agreed to put up $5.8 million at 4.74 per cent over 25 years for a federal office building in Albuquerque; $11.5 million for an Atlanta building and $2.1 million for a Kansas City building, both at 4.97 per cent for 25 years, and $1.6 million at 4.97 per cent for ten years for a building in Council Bluffs Iowa. The Equitable Life Insurance Co. of Iowa agreed to provide $1.1 million for ten years at 5 per cent for a Burlington Iowa building. No acceptable bids were received on five other projects out of the first "test group" of ten that

continued on page 11

DIMITRI KESSEL—LIFE

NEW IDLEWILD AIRPORT DEDICATED

The Old World grace of a fountain highlights the New World's shiniest port of entry. The $30 million arrivals and ticketing buildings of New York's Idlewild International Airport flank the control tower. Officially opened last month, the buildings will be reported fully in next month's FORUM.

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GSA advertised last month. Its prompt approval of the first five at rates up to 5 per cent, however, gave institutional lenders their first clear indication of what rates GSA might consider "reasonable" and was expected to increase the number of offers GSA would receive on future projects.

Currently GSA has authority to proceed with 97 lease-purchase projects to cost about $700 million, including the five approved last month. Basic lease-purchase legislation was allowed to lapse last July, but, GSA officials hope present progress with the program will influence Congress to re-enact the basic law and allow it to plan many more sorely-needed public buildings throughout the country using this method of financing.

The post office has a separate, smaller lease-purchase program: 48 projects to cost a total of about $24 million. On the first (and biggest) project, a $7.4 million post office for Denver, the Post Office Department advertised after the Budget Bureau canceled its 4 per cent yield limit, it received six bids—the lowest at 5.125 per cent. It rejected them all and will call for new bids in another few weeks, after revising the construction plans to save on gross costs. This month the Post Office will also advertise another 10 or 12 projects for a total of about $2.5 million.

While the GSA program was in suspension and limited to 4 per cent yield, Omaha business and civic leaders concocted a plan to assure early construction of a ten-story $9.5 million federal building and post office (designed by three local architectural firms: Henningson, Durham & Richardson; Steele, Sandham & Steele, and Kirkham, Michael & Associates). To circumvent the yield freeze, the city of Omaha assumed the role of builder-investor. By selling 25-year tax-exempt revenue bonds, backed by GSA's lease payments, the city could obtain funds for less than 4 per cent—a far lower cost than a private investor-builder would have to pay. Omaha voters approved this precedent-setting plan by a two-to-one margin last month on assurances that it would not cost local taxpayers a cent. The Chamber of Commerce, in fact, put up $30,000 to cover the costs of the special election.

The Omaha plan reflects an ironic situation: years ago the federal government abolished tax exemption on all federal borrowing, but in this case a federal project will use the tax-exempt privileges of a *local* government.

BUILDING ACTIVITY

New York City's office building boom is still robust, Astor Plaza postponement misinterpreted

When Vincent Astor temporarily halted excavation work for his 46-story Astor Plaza office building in New York in October, rumors spread far and fast. Lack of mortgage funds was the most widely rumored reason for the suspension, and in many quarters this was erroneously interpreted as a sign that New York's fabulous office building boom (FORUM, March '57) was nearing its end.

Behind the stated reason for the suspension, however, there were other complex reasons that discreet Astor aides preferred not to discuss. Most unofficial stories suggest that the project somehow drifted out of control for lack of wise, forceful coordination somewhere near the top. According to one report, Astor innocently or inadvertently disposed of too many "pieces" of the equity position too liberally—and one day was shocked to discover that he was to supply practically all the necessary cash but would receive scarcely half of the property's earnings.

By other accounts, Astor summarily dispensed with the services of two groups previously associated with the project, virtually tore up the entire original deal, and then faced up to two unhappy alternatives: 1) to dispose of major control of the entire project to other interests, or 2) to reorganize the project into a more practical, workable building and investment "package" again almost from scratch.

Project never dropped

Several points are crystal clear, however. The project has never been canceled. Ever since October, when work was suspended, the Astor office has been busy on the project. All New York real estate and building authorities expect to see the job go ahead again before long, because the property is basically so valuable, so well located, and otherwise so suitable for a major office building.

What rankled many of the city's realty and building leaders was the undue attention and misinterpretation the Astor upset received—as if it were a warning of an impending industry-wide recession. Actually, how robust is the Astor Plaza project and the over-all New York building boom in general?

The best answer is to be found in the number of experienced New York builders who were ready to take over all or part of the Astor venture when it was "peddled all over town." The most savvy, however, wanted the right to make some changes in the project in line with their own ideas of the best kind of building to erect, and the easiest to finance. Most wanted to reduce the open plaza area to obtain what they considered a "more economical" building with larger floors than provided in the original architectural plans of Carson & Lundin, Kahn & Jacobs, associated architects. One had a more specific objection: that the proposed structure was "over-elevatored" for its size—an expensive luxury.

There was one factor that would prevent any drastic changes or downgrading for the project, however. Other members of the Astor clan control the land, and, as a condition to leasing it to Vincent (or his successors), they retain veto control over the design of any building erected on it. So far, the collective Astors are interested only in proposals guaranteeing a prestige development compatible with what they consider the site's greatest long-range investment potential.

Industry leaders are far more willing to be quoted on the general outlook for new office construction in New York.

ASTOR PLAZA project suspension set building industry buzzing. Most guesses as to why work stopped were wrong. Carson & Lundin, Kahn & Jacobs, associate architects.

By the latest count of the Real Estate Board of New York, 73 buildings of some 19.3 million square feet have been completed since the end of World War II; 15 structures with another 5.7 million square feet are under construction; plans have been filed for 29 more with an additional 14.4 million feet.

Most authorities agree that prospects are bright for several more years of high building activity. Typical views:

▶ "We may be getting near the peak of demand," says Norman Tishman, president of the Tishman Realty & Construction Co., Inc. A month ago this company opened its newest, 38-story, 1,050,000 square foot building at 666 Fifth Ave., 92 per cent rented. Although his company has no other New York office building on the boards at present, Tishman said it would not hesitate to undertake another if a "package" that met all its criteria materialized: good location, good land price, and an initial commitment from one substantial tenant for about 20 per cent of the building, as a starter.

▶ Erwin S. Wolfson, chairman of Diesel Construction Co., Inc., gave several examples of the rental market potential that are encouraging him to plan additional structures. At the completion of steelwork last month, his newest insurance district building (100 Church St.) was 90 per cent rented. An amazing number of tenants in old, off-location buildings want new, modern quarters, he declares. He cited one industry group of eight or ten companies that are now dispersed in a midtown fringe area, but have indicated their desire to locate closer to each other in a new first-class structure of about 500,000 square feet. A second industry group that would require about this much space also is "ripe" for a similar move, he said.

▶ Over the next six to eight years New York can absorb another 15 million square feet of new space, according to Wylie F. L. Tuttle Jr., of Collins, Tuttle & Co., agent for many of the city's new buildings. Tuttle cited a building at 42nd St. and Third Ave., that was 82 per cent rented upon completion of steel work last month. Others are renting equally well, he said. Tuttle also said he knew of seven so-far unannounced office projects currently being "worked up" by various investor-builders.

▶ Conservative but optimistic, Edmund F. Wagner, president of General Realty & Utilities Corp., reported good demand, although admittedly some slow-up. "You can't add 25 million feet to the supply without affecting the market," he explained. "Of course 'the tree doesn't grow to the sky.'" Last month his firm's new uptown textile area building at 40th St. and Sixth Ave. was 60 per cent rented when steel was raised; its 20 Broad Street tower, adjoining the Stock Exchange, completed last May, had been 100 per cent rented before steel was above ground. He said he would consider starting another building, but only in a prime location and only at the right terms.

Most industry leaders reported rents for new space holding firm, and Tuttle predicted they would probably rise this year because of reduced production in the face of steady demand. Typical space in a good new building that would have leased for $4.75 a square foot four years ago now costs about $5.25 a foot, Tuttle estimates, and may advance to perhaps $5.50 by the end of this year.

But if actual dollar rents are not declining, some observers report market "easing" of another type. More new buildings are offering floor covering, venetian blinds and other amenities. And average leasing periods are shortening, from about 15 years two or three years ago to perhaps 11 or 12 years today. Owners of older buildings are still re-renting at very high rates all the space vacated by tenants moving into new structures, but to do so they are finding it increasingly necessary to offer concessions and provide air conditioning or other expensive capital outlay modernization. Mortgage financing has also been becoming noticeably more difficult for older unmodernized buildings.

As always, the key to all construction is the availability of mortgage funds. Admittedly this has been a troublesome factor and something of a drag during the past two years. At one point, for instance, insurance companies were quietly but quite effectively advised that the State Insurance Department (which never overtly presumes to interfere in investment policies) would be much happier if they tightened their mortgage-bond financing practices. After that, such bonds were treated exactly like regular mortgage loans when these lenders determined the amount of money to advance on any single building, and this made it necessary for owner-builders to provide 5 to 10 per cent more equity than previously for some office ventures. Almost without exception, however, New York experts believe that any sound, well-located, quality-tenanted structures, if they are promoted by experienced owner-builders, can obtain financing without excessive difficulty—and this includes Astor Plaza.

Actually, the postwar lending pattern for new office buildings has had a built-in safeguard against reckless, speculative overbuilding. As a rule, commitments have not been binding until the builder showed the lender long-term lease agreements from enough satisfactory tenants to assure financial

ART

Competitions decide two mural and sculpture awards

Artists were encouraged last month by two new buildings that will use specially commissioned murals and sculpture to complement their architecture.

▶ In Lincoln Neb., the Continental National Bank announced a $25,000 first-prize competition for a large 12½ foot by 96 foot mural, "The Riches of Nebraska," to cover one entire wall of its new glass-front building by Davis & Wilson, Lincoln architects. From applicants who qualify by March 1, the bank's mural committee, chaired by Fred N. Wells of the Nebraska Art Association, will choose up to six finalists. Each of these will be paid $2,500 for their sketches, which will be exhibited for two weeks in July for public balloting as part of the procedure for selecting the top prize winner. The state governor will also cast a vote.

▶ In New York, Builder Erwin S. Wolfson awarded a $12,000 commission to Sculptor Frank Eliscu to execute a 6½ foot bronze nymph and lobby fountain for a 20-story, $28 million office building for the Diesel Construction Co., headed by Wolfson. This building designed by Emery Roth & Sons is now nearing completion in the insurance district. Eliscu won the commission in a four-man competition conducted for Wolfson by the National Sculpture Society under the direction of Leo Friedlander, Paul Manship and Sidney Waugh. The other competitors were Clara Fasano, Herbert Lewis Kammerer and Anthony de Francisci.

stability for the building, even if the rest of its space remained vacant indefinitely. Under this system, for instance, excavation had not even been started last month for the 60-story, $50-to-$60-million, stainless steel New York tower just north of Rockefeller Center that was announced in Dec. 1956 by Realtors Peter B. Ruffin and John Galbreath (FORUM, Jan. '57).

Once-burned-twice-shy lending institutions developed this system out of their painful memory of the large numbers of speculative buildings they had to acquire through foreclosure in the Thirties.

As Realtor-Developer Robert W. Dowling, president of the City Investing Co., puts it: "There is really no risk of New York becoming wildly overbuilt again this time. This loan commitment system devised by our highly educated lenders will prevent it."

BUSINESS

Lumber exchange closes for lack of volume

Western lumbermen who tried to pioneer in Portland Ore. a National Lumber Exchange that would operate like the nation's security and commodity exchanges (FORUM, Oct. '57) have admitted failure.

On Dec. 4, little more than a month after opening, officers closed the exchange because of insufficient business. This was accentuated by the extreme slowness of the entire lumber market in recent months, and also by opposition from some large wholesalers who objected to the exchange's willingness to sell direct to retail lumber dealers.

Fred C. Talbot, board chairman and treasurer, said the founders of the exchange, which was organized as a private company, are now forming a standard type of wholesale lumber products firm, Lumber National, Inc., to replace their ill-starred trading floor and "big board" venture. He said the short-lived exchange had demonstrated the feasibility of the idea, "but in any commodity exchange, volume of business and complete cooperation of industry are necessary ingredients for success." If another attempt is made to establish such an exchange, he added, it should be a cooperative effort with more support from all segments of the forest products industry.

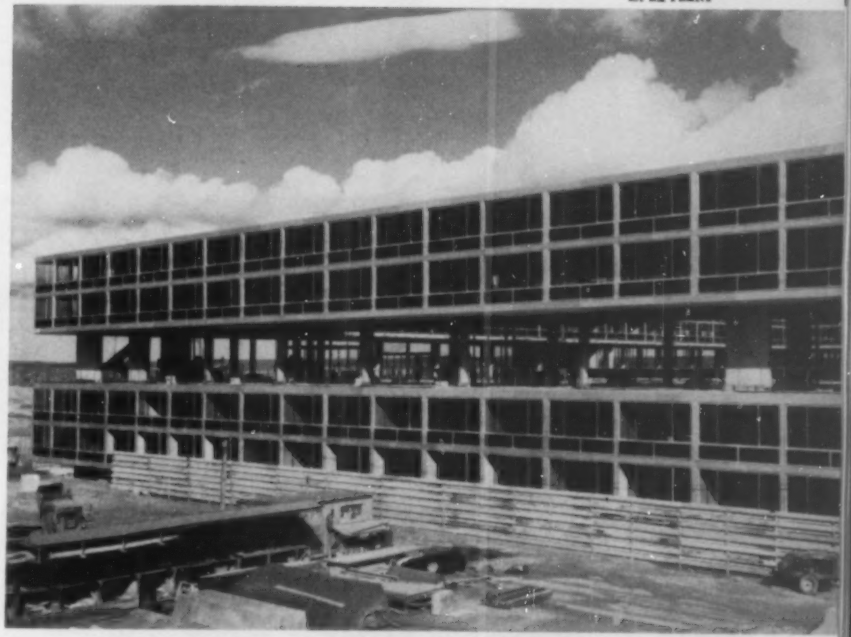
H. LA PLANT

AIR ACADEMY TAKES SHAPE

Two and a half years ago, Architect Nathaniel Owings of Skidmore, Owings & Merrill looked at the pine-covered grandeur of Colorado's Rampart Range, then at SOM's model for the new, $126 million Air Force Academy which is to lie on the broad plain beneath the mountains. In this setting, Owings said, "the buildings themselves should seem unimportant."

As these first Air Academy buildings rise from the shadow of the Ramparts, it is obvious Owings was too modest. The service buildings (left) and the dormitories (below) already show the lean crispness that characterizes SOM design. Finished in glass and aluminum, the dormitory and classroom complex (bottom) dominates the scene. The first cadets will move into the academy next September, although all buildings will not be finished for about four more years.

H. LA PLANT



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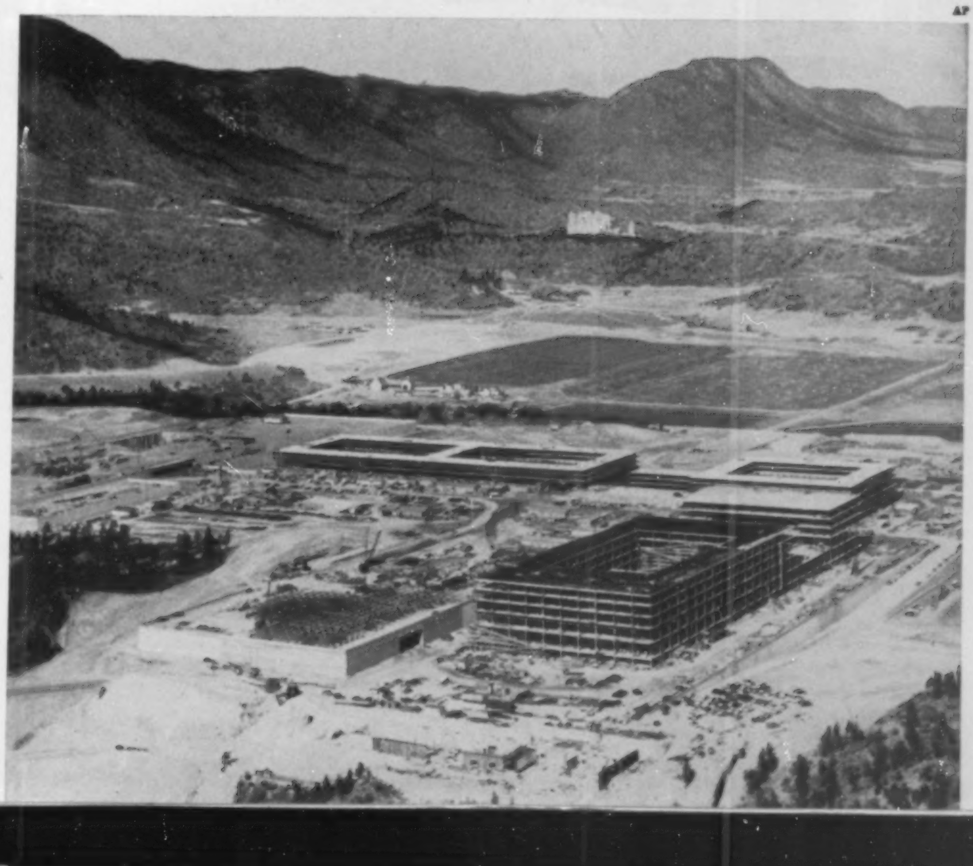

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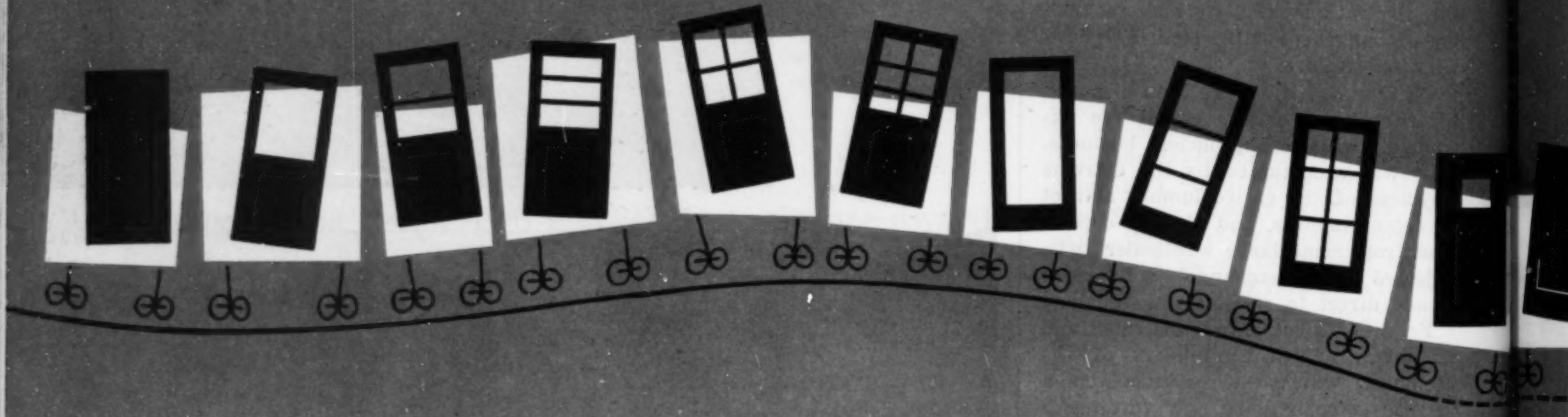

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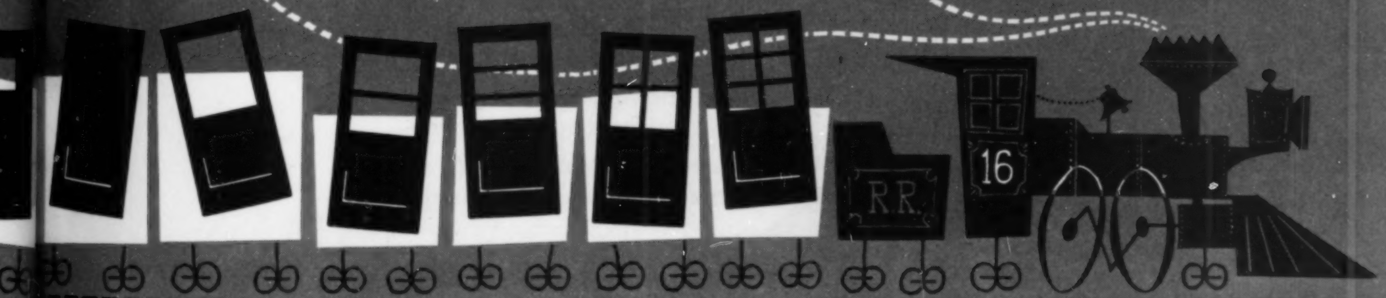

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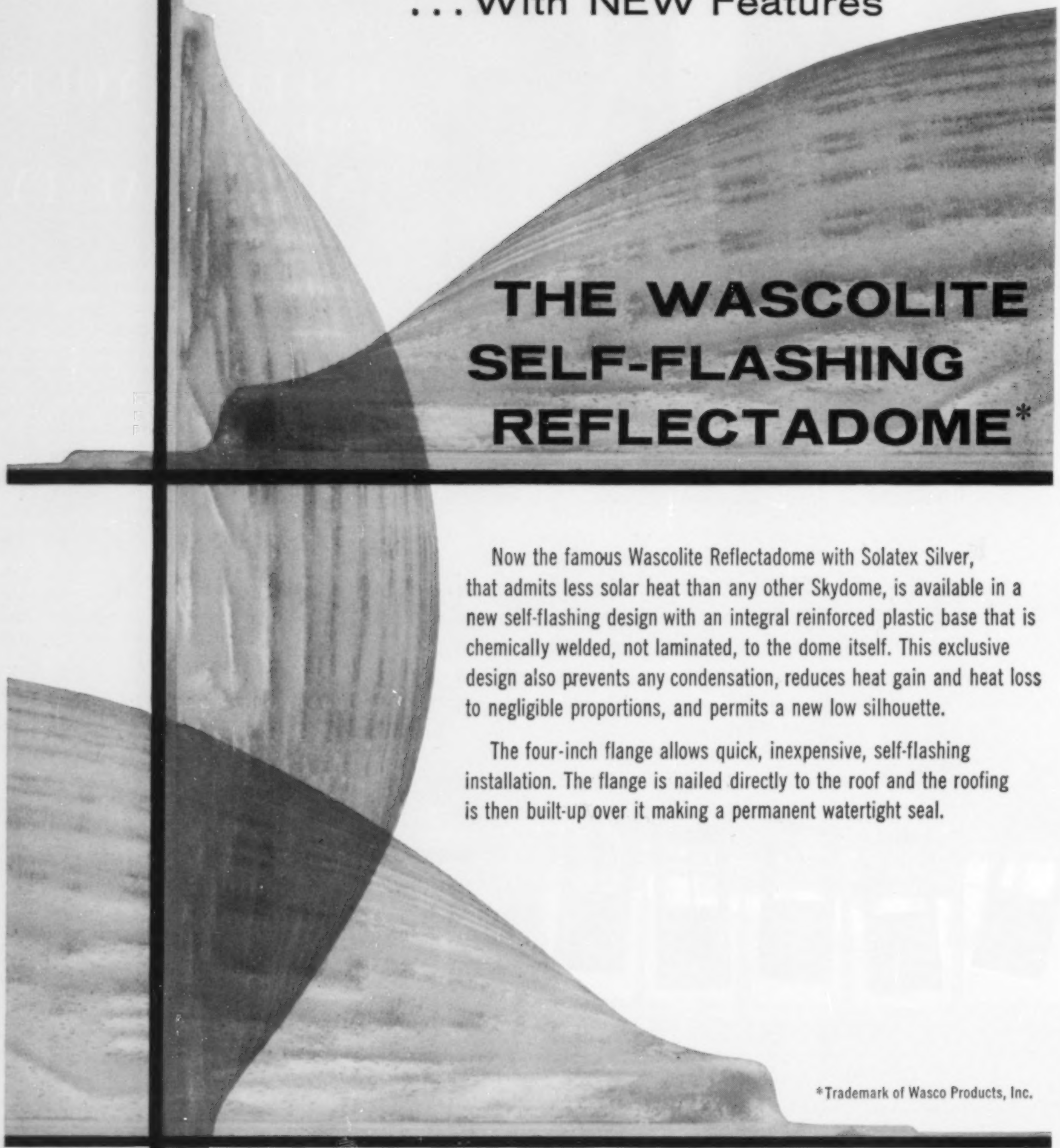

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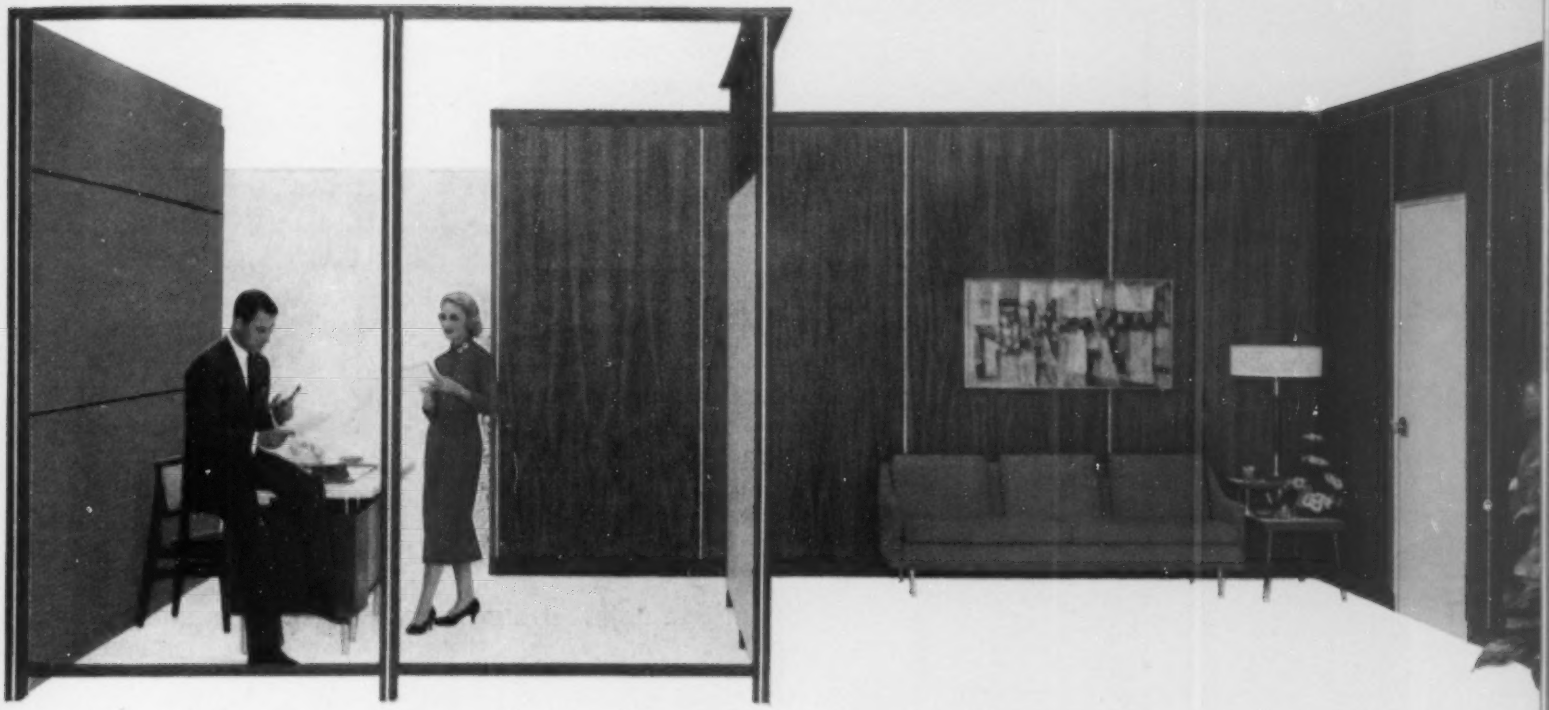

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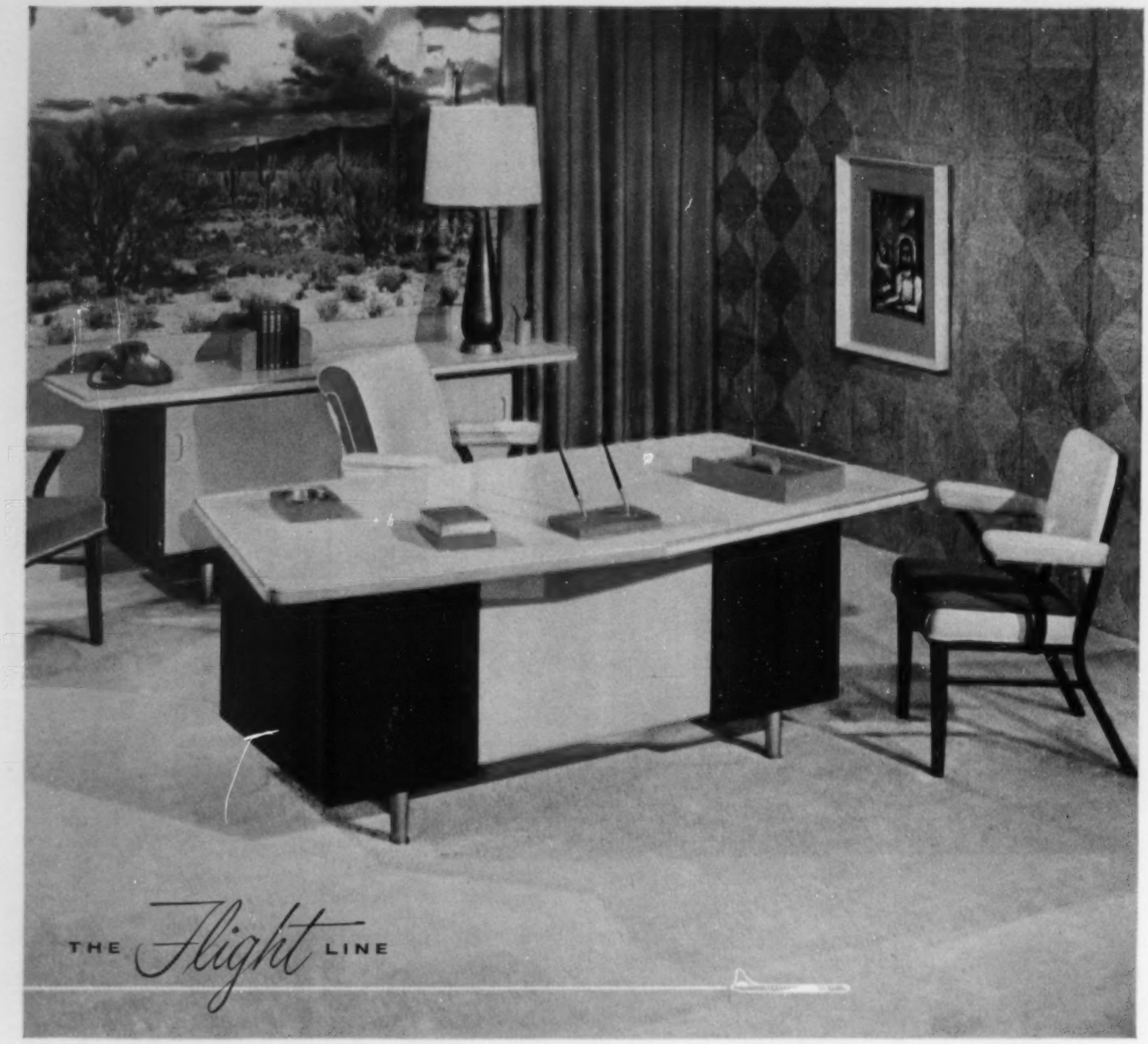

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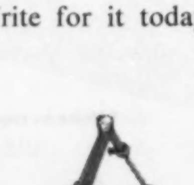

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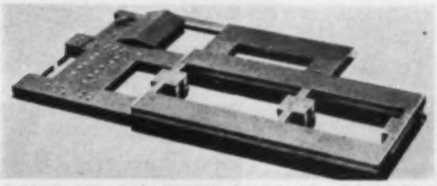


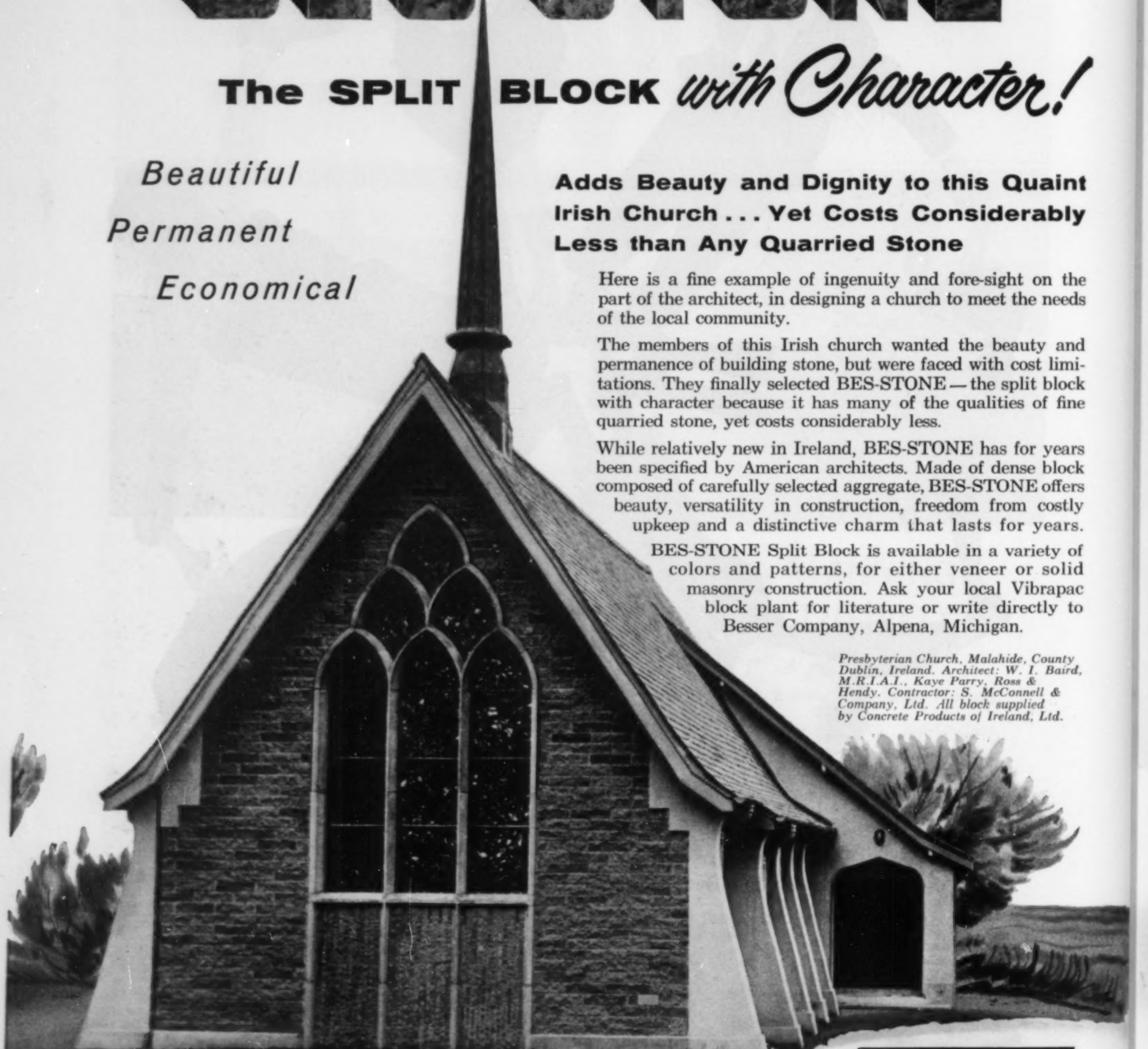
GOING UP ALL OVER AMERICA—SCHOOLS WITH FIBERGLAS BUILT-UP ROOFS

and Fiberglas Roof Insulation. This is the Lake Forest Hills High School in Jacksonville, Florida . . . one of the many types of buildings coast to coast where Fiberglas Built-Up Roofing and Fiberglas Roof Insulation have been used together with notable success.

BES-STONE

The SPLIT BLOCK *with Character!*

Beautiful
Permanent
Economical



Adds Beauty and Dignity to this Quaint Irish Church . . . Yet Costs Considerably Less than Any Quarried Stone

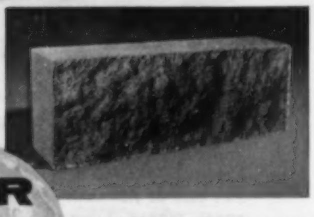
Here is a fine example of ingenuity and fore-sight on the part of the architect, in designing a church to meet the needs of the local community.

The members of this Irish church wanted the beauty and permanence of building stone, but were faced with cost limitations. They finally selected BES-STONE — the split block with character because it has many of the qualities of fine quarried stone, yet costs considerably less.

While relatively new in Ireland, BES-STONE has for years been specified by American architects. Made of dense block composed of carefully selected aggregate, BES-STONE offers beauty, versatility in construction, freedom from costly upkeep and a distinctive charm that lasts for years.

BES-STONE Split Block is available in a variety of colors and patterns, for either veneer or solid masonry construction. Ask your local Vibrapac block plant for literature or write directly to Besser Company, Alpena, Michigan.

Presbyterian Church, Malahide, County Dublin, Ireland. Architect: W. I. Baird, M.R.I.A.I., Kaye Parry, Ross & Hendy. Contractor: S. McConnell & Company, Ltd. All block supplied by Concrete Products of Ireland, Ltd.



BES-STONE, the modern building material, made from Vibrapac Block produced on a Besser Vibrapac. Available in standard wall widths.

BESSER Company

Dept. 179 • Alpena, Michigan, U. S. A.

FIRST IN CONCRETE BLOCK MACHINES

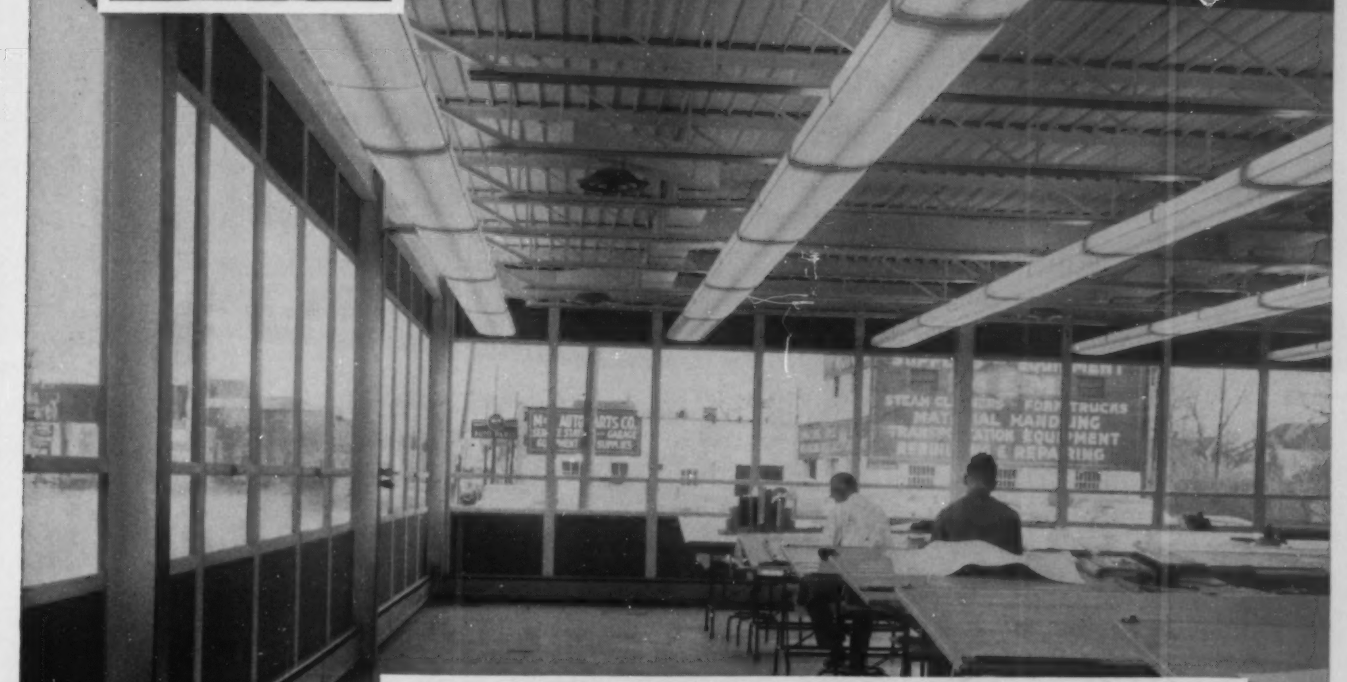
BESSER

A7–152–1PBC

"Large, glare-free glass areas provided by american LUSTRAGRAY have increased the efficiency and added to the comfort of our draftsmen"

—says Charles C. Owens, *president of Campbell Engineering Inc., Detroit, Mich.*

Below—*New 80′ x 80′ drafting room, glazed by West Detroit Glass Co. AMERICAN LUSTRAGRAY reduces sun glare approximately 50% and actually sharpens the view.*



Right—*It's new. Designed and engineered by Campbell Engineering Inc.—Built by H. F. Campbell Construction Co.*

President Owens speaks from first-hand experience with AMERICAN LUSTRAGRAY sheet glass. Even in critical work areas, its glare reduction minimizes eyestrain and fatigue. Viewed from the interior, this neutral gray tint glass gives "clear glass" vision. Seen from the exterior, LUSTRAGRAY'S visual density provides a skin wall effect. This permits large glass areas without losing building design effect.

LUSTRAGRAY reduces both sun glare and heat transmission. It is the most economical gray glass on the market. Thicknesses: 3/16″, 7/32″, 1/4″. Maximum size: 6′ x 10′. Available through more than 500 glass jobbers. Write our Architectural Promotion Department today for new 1958 General Catalog for your AIA file.

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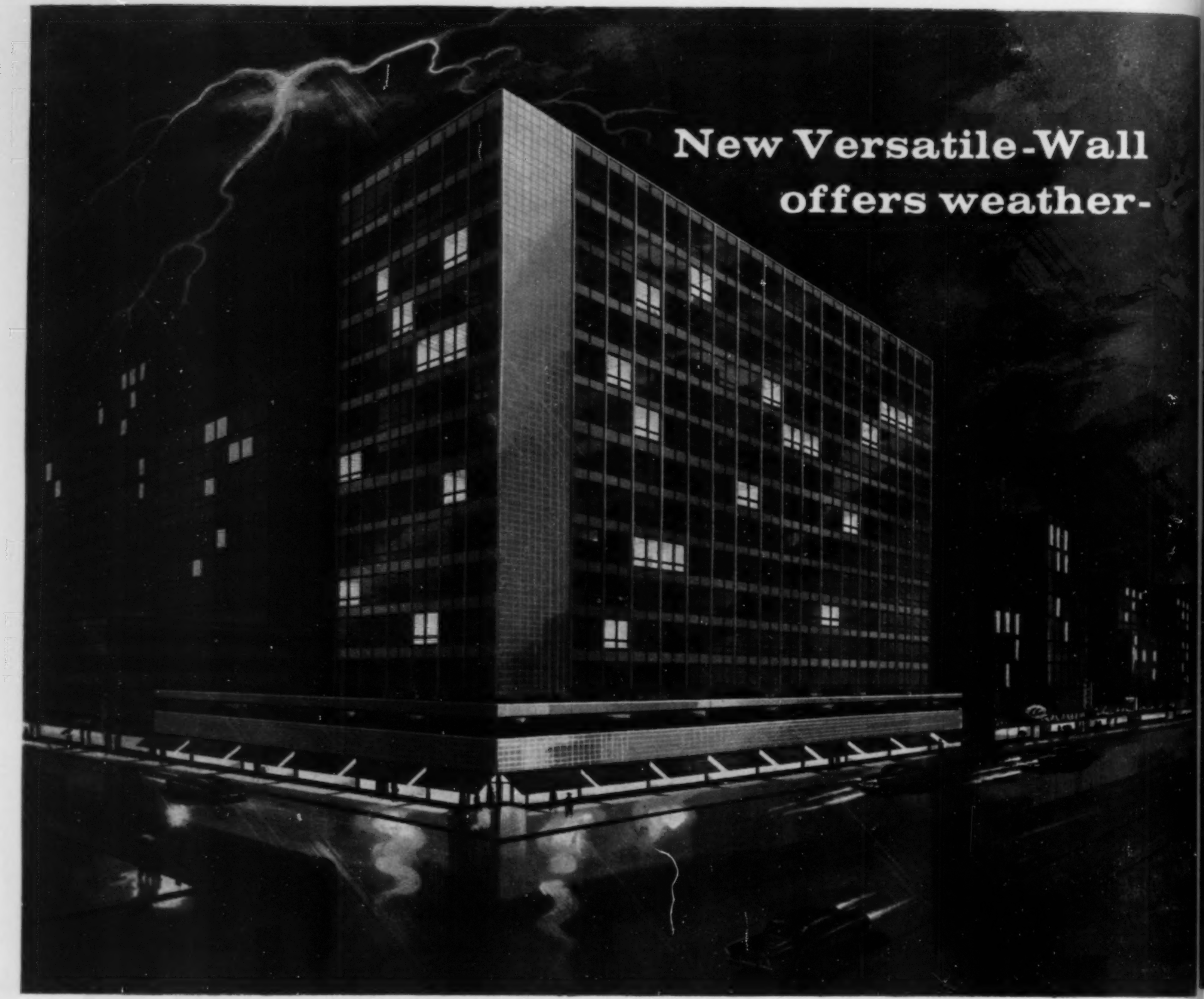
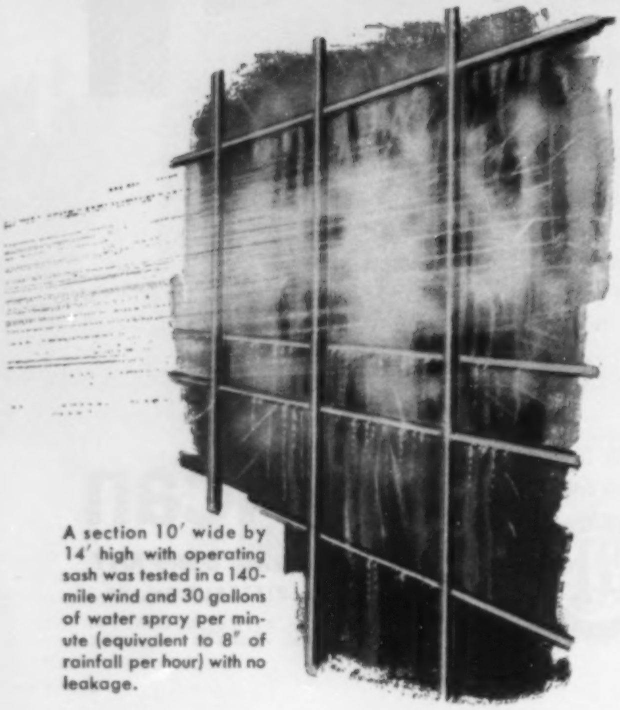


New Versatile-Wall offers weather-

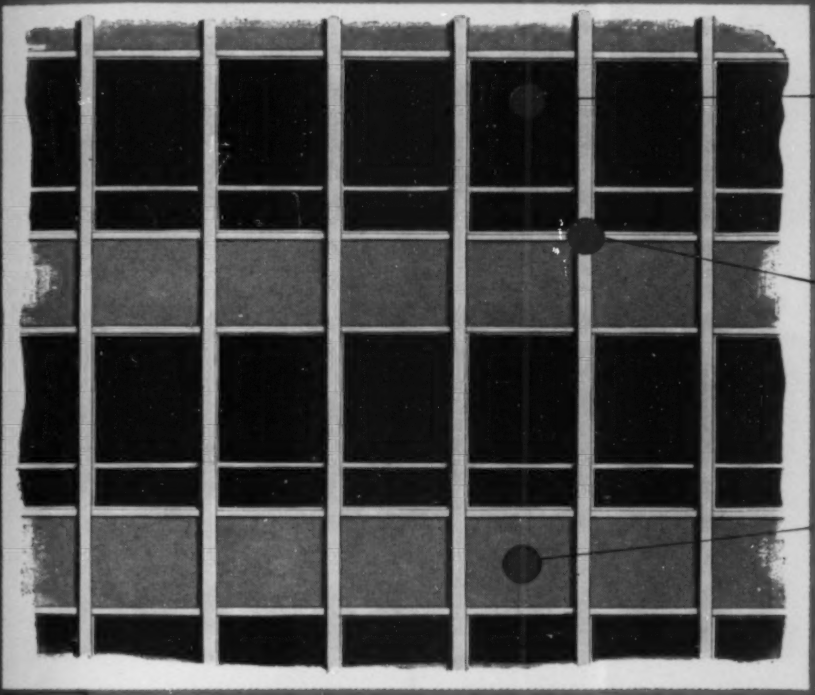


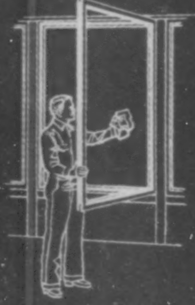
A section 10′ wide by 14′ high with operating sash was tested in a 140-mile wind and 30 gallons of water spray per minute (equivalent to 8″ of rainfall per hour) with no leakage.

With Robertson Versatile Wall, architects and engineers can enjoy full freedom of expression in the use of modular units and colors and still be sure of the precision of fit necessary to resist the ravages of weather. Developed after years of experience, research and testing, this curtain-wall system combines the advantages of standard units with the artistic latitude of tailor-made walls.

The results of extremely severe tests proved beyond a doubt that the rugged, weathertight construction of Robertson Versatile Wall can more than withstand the devastating forces of hurricanes and tornadoes. Units are designed to expand and contract to take care of building movement and steel framing tolerances without loss of tight seal. Yet infinite design variety is available. Verticals can be made with a variety of sizes and shapes in stainless steel, aluminum, bronze or porcelain enameled metal. Spandrels also can be designed in a great variety of colors and textures.

tightness plus extra design freedom





ROBERTSON V-WINDOWS

Exclusive new side hinged inswinging windows make cleaning easier and safer, and seal positively when locked. There is no interference from pivot pins if hopper is used below, and the entire window can be removed in minutes for easy shop reglazing.

MULLIONS AND SILLS

Great versatility is yours. Trim members can be porcelainized aluminum, stainless, aluminum or bronze. Trim also can vary greatly in depth and surface because of new positive "snap-on" design. A system of weep holes provides positive drainage and ventilation for condensation.

SPANDRELS

Here the designer has infinite choice. The V-Panels are available with a wide variety of surface patterns and can be fabricated in aluminum, bronze, stainless steel, Color Galbestos or vitreous enameled aluminum or steel. *Versatile Wall is as individual as your signature!*

Though any type of window can be specified, there are many advantages to the new Robertson V-Window. Hinged at the side, it swings into the room for safer and easier cleaning, plus a more positive seal than possible with a pivoted window. An ingenious hinge allows the window to be removed and replaced with a spare, so that any reglazing can be done in the shop. Moreover, when a hopper window is specified underneath, weight is better distributed on the sill, and it is not necessary to accommodate pivots.

When you design your next curtain-wall building, take advantage of this completely "weather-wise" system which allows so much architectural latitude. Write for literature.

With 150 trained sales engineers and 60 qualified service dealers, Robertson is ready to serve you in any part of the country. You will always have the best of technical assistance when Robertson products are specified.

Robertson
Versatile
Wall

H. H. Robertson Co.
50 years of experience in Puttyless Glazing Construction
2403 Farmers Bank Building • Pittsburgh 22, Pa.
In England—Robertson Thain Ltd., Ellesmere Port, Cheshire
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Please send additional information.

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COMPANY ____________________
ADDRESS ____________________ CITY ____________________

Here's what makes Bronze Valves

1510
WALWORTH

TYPICAL OF WALWORTH QUALITY is the union body-to-bonnet connection which stiffens the body against internal pressure; makes taking the valve apart a simple operation and reduces the chances of distortion or leakage even though the valve is repeatedly taken apart and reassembled. With this type of construction there is no possibility of the bonnet coming off the valve while the handwheel is being turned.

HEAVY BODY CONSTRUCTION is typical of *all* Walworth Bronze Valves. Extra-thick walls and rugged wrench hexes constitute a high safety factor and prevent distortion while the valve is being installed in the pipeline. Extra-deep pipe threads are accurately machined to eliminate leakage. Walworth Bronze Valves are also available with flanged, silver-brazed or soldered ends in certain sizes and types.

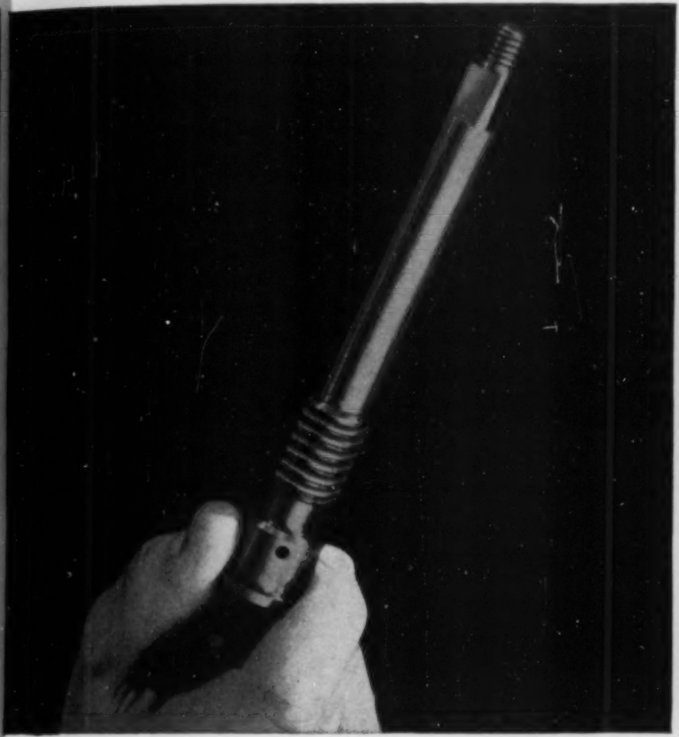
MEET THE CHAMP! The chief engineer of a midwestern plant had used a parade of valves in severe boiler blowdown service. Most didn't last longer than 60 days. None survived 90 days.

On the recommendation of a Walworth Representative the engineer installed the Walworth No. 225P Bronze Globe Valve shown here, stating that he would be entirely satisfied if it lasted a bare three months. Exactly 4 years and 362 days later the valve was taken out of service—not due to the wire drawing, steam cutting and galling which made the other valves short-lived—but because the highly turbulent steam finally wore a small hole in the body.

This is the kind of valve satisfaction you get—when you specify and use Walworth Bronze Valves. They are the longest wearing, toughest bronze valves on the market.

Walworth Subsidiaries: ALLOY STEEL PRODUCTS CO. • CONOFLOW CORPORATION • GROVE VALVE AND REGULATOR CO.

Walworth *the* real bargain!



EXTRA-LARGE STEMS with extra-long, extra-deep threads prolong valve life, protect against wear and distortion and provide tight positive shutoff. The surface of the stem is machined to a glass-like finish for minimum handwheel effort and to preserve the packing which results in fewer inspections and less maintenance. The top of the stem is tapered and squared to hold the handwheel securely.

TO REDUCE WIRE DRAWING to a minimum, certain types of bronze globe valves have stainless-steel plug-type seats and discs heat-treated to a nominal hardness of 500 Brinell, adding years to valve life even in severe services. These valves can be tightly closed on sand, grit or pipe scale without damage. Seats and discs are machined simultaneously, assuring perfect mating.

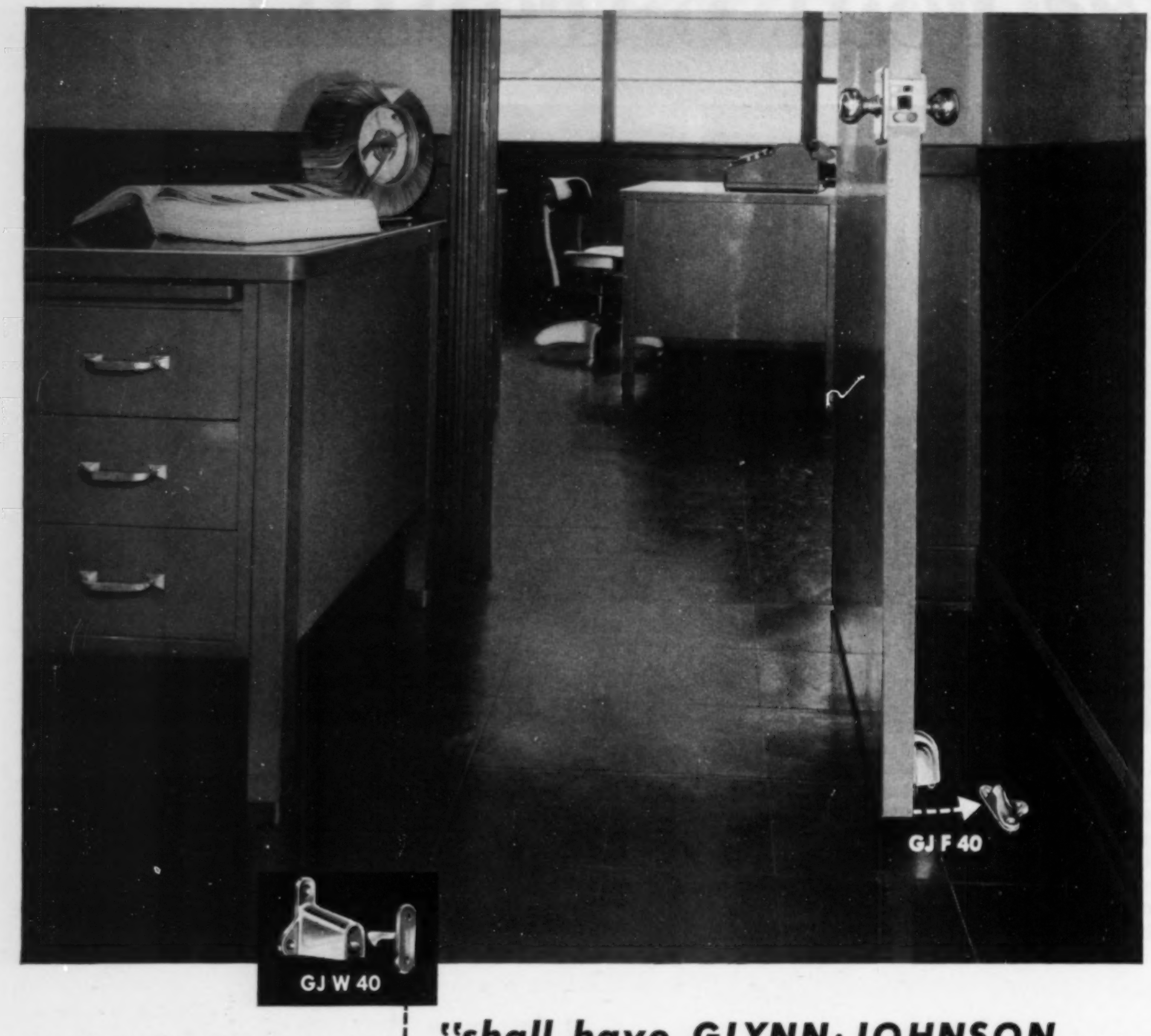
There is a Walworth Bronze Gate, Globe, Angle or Check Valve for every service. Walworth is continually developing new valve types and materials, including plastics, to keep pace with the growing variety and severity of services in modern industry. For full information, see your Walworth Distributor or write: *Walworth, 60 East 42nd Street, New York 17, N. Y.*

WALWORTH

Bronze Valves and Fittings

M & H VALVE & FITTINGS CO. • SOUTHWEST FABRICATING AND WELDING CO., INC. • WALWORTH COMPANY OF CANADA, LTD.

an ideal specification for efficient
OFFICE DOOR CONTROL



This ideal GJ specification for office doors is used in such outstanding office buildings as:

Socony Mobil Building, New York City Harrison and Abramovitz and John B. Peterkin — associated architects

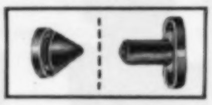
State Mutual Life Assurance Company of America, Worcester, Massachusetts. Hoyle, Doran and Berry, Boston, Mass. — architects

A & E and Research Buildings, Whiting, Ind. Holabird & Root & Burgee, Chicago, Illinois — architects

"shall have GLYNN·JOHNSON . . .

GJ F 40 FLOOR TYPE (or GJ W 40 wall mounted) COMBINATION DOOR STOP AND HOLDER." (This simple, fool-proof device engages silently and automatically to hold the door open. Releases with a firm pull. Especially recommended for doors opening more than 110°, or to meet budget limitations. All working parts are enclosed in a streamlined case for maximum durability.)

"THREE GJ 64 for metal frame (or GJ 65 for wood frame) RUBBER SILENCERS." (Form pneumatic air pockets to absorb shock or noise of closing and create constant latch tension . . . no door rattling.)



Also GJ shock absorbing overhead arm type door holders for entrance and other heavy duty doors.

write for complete information and details

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HOW

J & J GOT 2 FOR 1

With Brown & Grist Window Walls, Johnson & Johnson got a two-story building for almost the cost of a one-story, conventional wall structure. B & G custom-built the 31-foot, two-story panels at stock prices. They went up fast, saving months of costly building time.

WHY

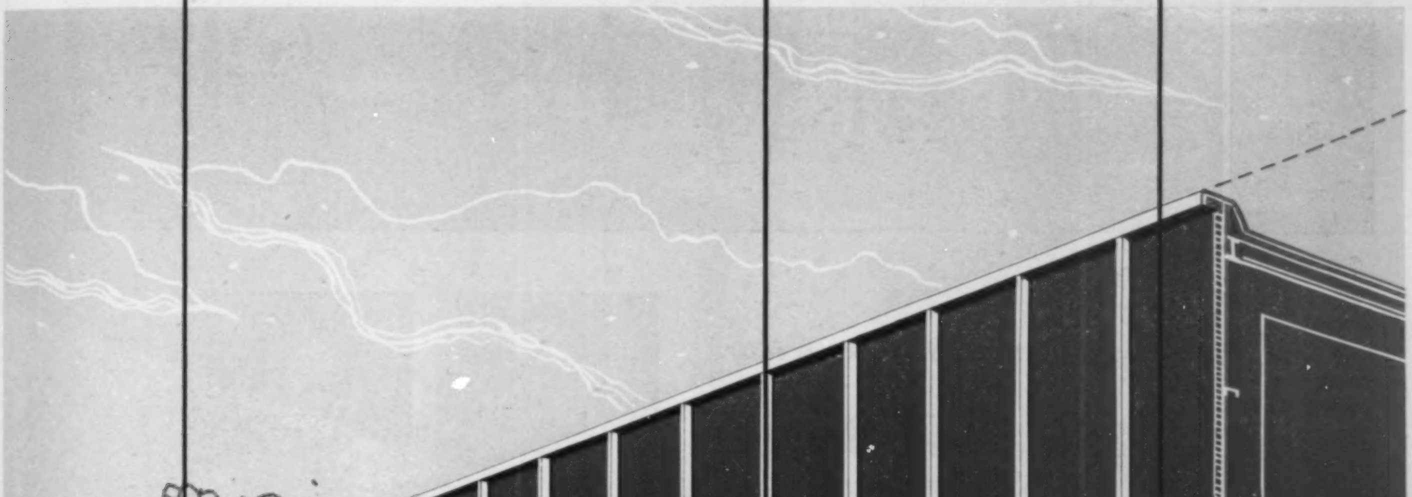
THE OVERHANG

This pleasing feature is also functional, keeping glare out, and letting daylight in. Thanks to the feather-lightness and high rigidity of Brown & Grist Window Walls, it could be included without costly structural steel support.

WHY

PORCELAIN PANELS

Designers picked porcelain-enamel steel for long wear, low upkeep. Like 100 available materials, these panels were weather-sealed at B & G's plant. Kidde engineers chose B & G because "price and delivery time were better" and "our experience with Brown & Grist has been very good."

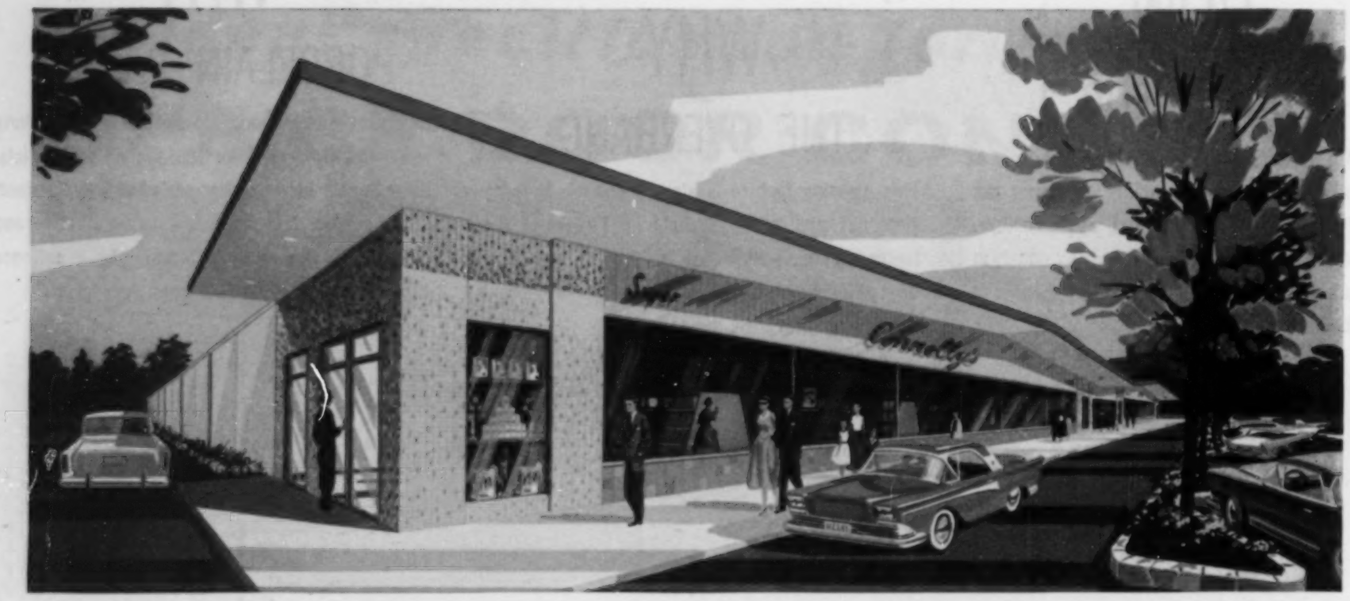


Johnson & Johnson's new Eastern Surgical Dressing Plant, North Brunswick, N. J. Engineered and built by Walter Kidde Constructors, Inc., New York and Houston

BROWN & GRIST WINDOW WALLS

Got a building on the board? Write for B & G Sweet's catalogs today!

BROWN & GRIST, INC. BG 25 Tyler Avenue, Warwick, Va.



Here's why architects Brown & Marx

specified **Butler** for this beautiful shopping center in Kenosha, Wisconsin

Robert F. Brown

John N. Marx

In-process shot of Kenosha project

Design a top quality structure on a modest budget—that was the tough assignment handed Chicago Architects Brown and Marx by the Town & Country Shopping Center.

The assignment was accomplished with the Butler Building System. In this system, a strong load-bearing Butler rigid frame and a weather-tight, die-formed Butler metal roof are the core of the building. Pre-engineering insures that these components fit together perfectly for fast, low-cost assembly. Exceptional economy and superior quality control are assured by mass production.

Around this core, Architects Brown and Marx designed the handsome structure pictured above. The question uppermost in their minds was how the use of pre-engineered and mass-produced Butler components would affect their design freedom. So they were pleased to find that the Butler Building System in no way hampered style, but rather made an interesting study. They were able to exercise imagination and skill in enclosing the rigid frame components in non-load bearing curtain walls of traditional construction materials, and in so doing achieve dynamic composition.

The shopping center consists of two low rigid frame Butler buildings 40′ apart. One is a 100′ x 140′ supermarket, the other a 100′ x 100′ hardware store. The area between is covered to provide space for two additional stores.

"This was our first experience with the Butler System," says Mr. Brown. "But not our last."

For details on the lowest-cost way to build well, see your Butler Builder. He's listed in the Yellow Pages under "Buildings" or "Steel Buildings."

BUTLER STEEL PRODUCTS

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Manufacturers of Buildings • Oil Equipment • Farm Equipment • Dry Cleaners Equipment • Outdoor Advertising Equipment • Custom Fabrication

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Why WEIRKOTE® zinc-coated steel carries lots of weight with today's architects

Specifications like this are becoming more and more an old story to architects everywhere:

> SHEET METAL WORK—Materials—Galvanized steel. Unless otherwise specified, this shall be of 26-gauge galvanized sheet steel, of "Weirkote" with make and gauge stamped on each sheet.

And there's plenty of reason for specifying Weirkote zinc-coated steel. Inside or outside the building—in heating and ventilating ductwork, ducts for dust and fume removal, rain drainage items; water type air coolers, other uses—Weirkote brings greater durability and corrosion resistance to sheet metal work. And the cost is low compared with other materials.

Weirkote, made by a continuous galvanizing process, has the skin-tight zinc coating that won't flake or peel despite punishing fabrication or rough handling on the job.

Free Weirkote Booklet

Send for the new Weirkote booklet today. Write Weirton Steel Company, Dept. **P-7**, *Weirton, West Virginia.*

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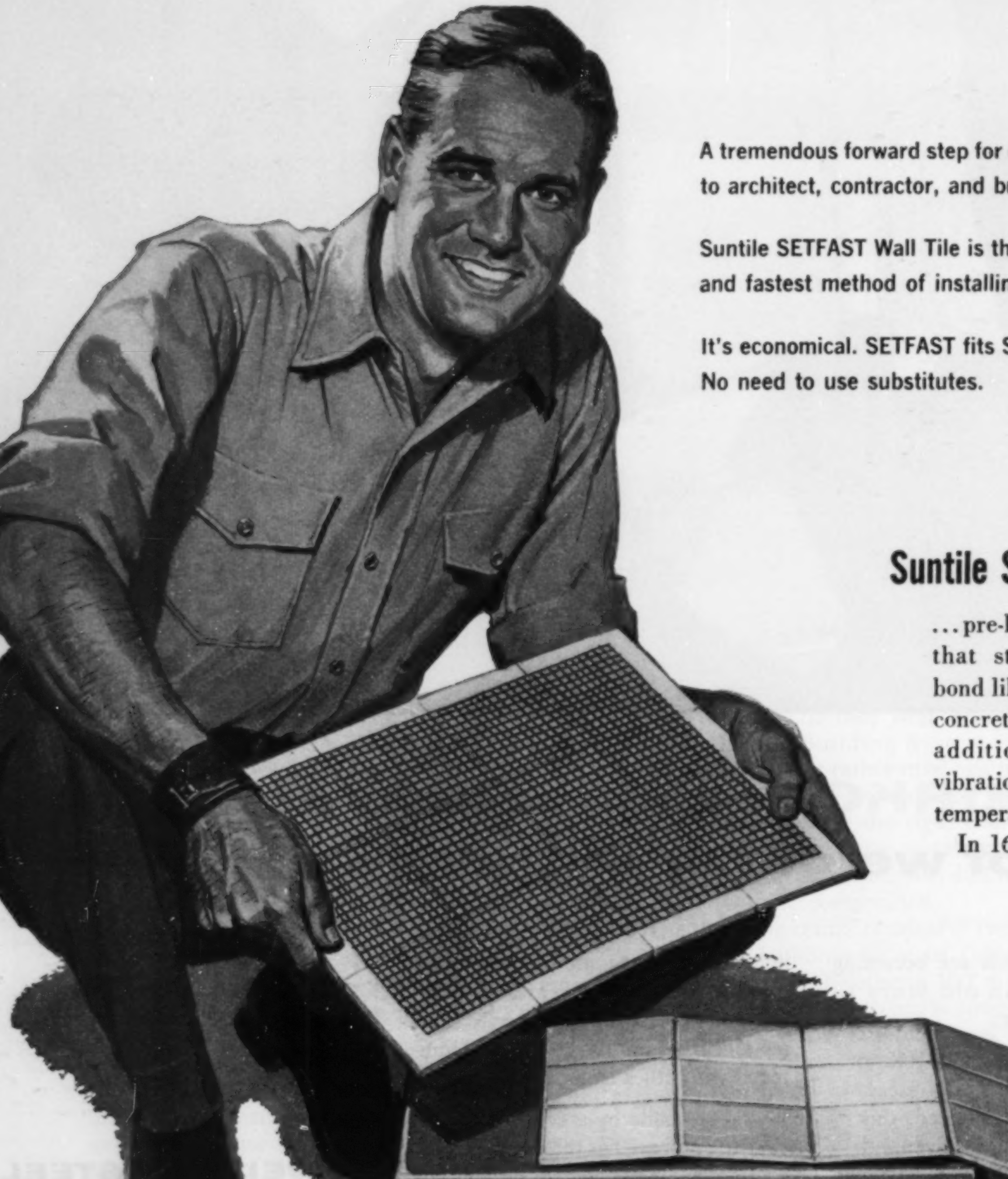
NEW Suntile
INSTALLS CLEAN AND EASY
Cuts Installation



A tremendous forward step for ceramic tile—with benefits to architect, contractor, and buyer!

Suntile SETFAST Wall Tile is the most modern, strongest and fastest method of installing tile.

It's economical. SETFAST fits Suntile to modest budgets. No need to use substitutes.

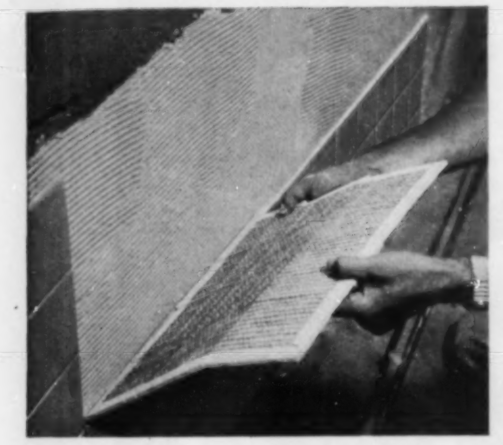
Suntile SETFAST Wall Tile

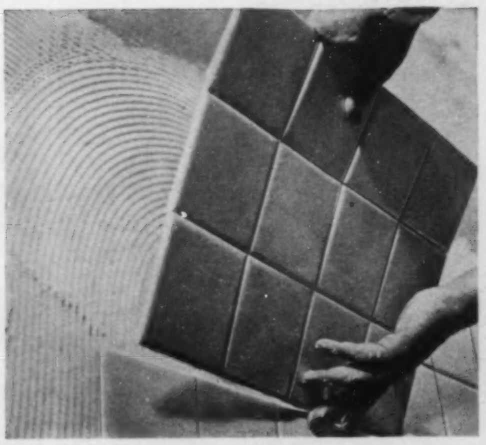
...pre-bonded on durable fiber that strengthens tile-to-wall bond like the ribs in reinforced concrete . . . and provides an additional safety factor for vibration, structural shifts and temperature changes!

In 16 most popular colors.

SETFAST* Wall Tile WITH STRONGEST BOND

Time and Costs


FAST INSTALLATION — Ideally suited for thin-set installation method using either an approved adhesive or self-curing mortar. Where necessary SETFAST may be installed over mortar beds of conventional thickness. No soaking required!


MODERN ECONOMY — 12-tile, factory inspected units cover 1½ sq. ft. Individual operations reduced.

PERFECT SPACING — beautifully precise, automatic alignment and easy handling. SETFAST Wall Tile conforms perfectly to minor irregularities in existing wall surface!

Suntile SETFAST Ceramics

— in one-by-two foot sheets offer you design versatility with unheard of economy!

Mechanic sets 288 one-by-one inch ceramics at once, perfectly bonded and spaced. He can inspect his work, avoid error, because he installs ceramics *face up*.

No paper to soak off, no mess to clean. Tile can be grouted immediately!

SETFAST ceramic patterns encourage originality in floor and wall design — patterns, geometrics, abstracts, and randoms.

Available from stock, *including the famous, exclusive Max Spivak motifs!* Send for catalog.

CAN OUR SPECIAL DESIGN STAFF HELP YOU?

Our ceramic artists, headed by Harry J. Macke, will be glad to suggest tile applications to your plans or elevations; or put your own tile designs in layout form.

*Patent Pending

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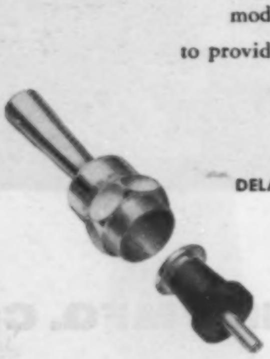
GENERAL SYSTEM

AUTOMATIC ◇ ELECTRIC

Framed in a gently rolling country club setting 15 miles Northwest of Chicago's Loop is this newest addition to the DELANY family of prestige installations . . . a manufacturing unit of the General Telephone System and one of the largest industrial buildings in Mid-America. A single 35 acre roof sheltering 10,000 employees, formerly housed in 17 multi story buildings, indicates the immensity of the structure.

Containing its own police and fire departments, a medical center, a bakery, and extensive dining facilities, the high standards of design are evident in details everywhere. In 41 gleaming ultra modern washrooms . . . each one a model of sanitation . . . nearly 700 DELANY diaphragm type FLUSH VALVES were selected to provide the attractive styling and unflagging service that such a carefully planned project deserves. Confidence in DELANY has made DELANY—"the fastest growing name in flush valves!"



DELANY FLUSH VALVES LEAD THE FIELD IN PRODUCT DESIGN AND DEVELOPMENT

One of the most advanced examples of superior design is the exclusive "Rubberflex" handle unit . . . standard on all Delany Flush Valves. Utilizing a wall of rubbers to seal off the possibility of leakage through the handle . . . the "Rubberflex" greatly reduces one of the most common complaints of flush valves. Containing four parts, the "Rubberflex" handle is entirely springless and packless.

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DELANY
Flush
VALVES

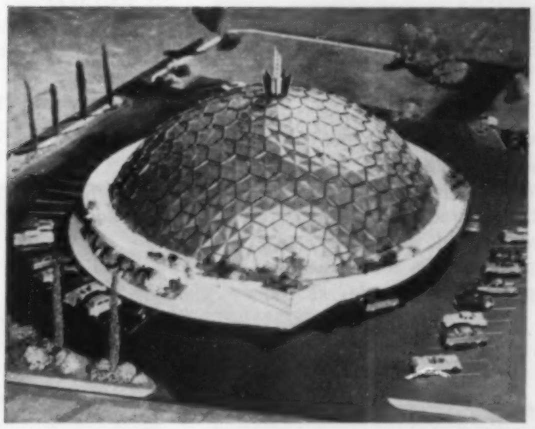
Since 1879

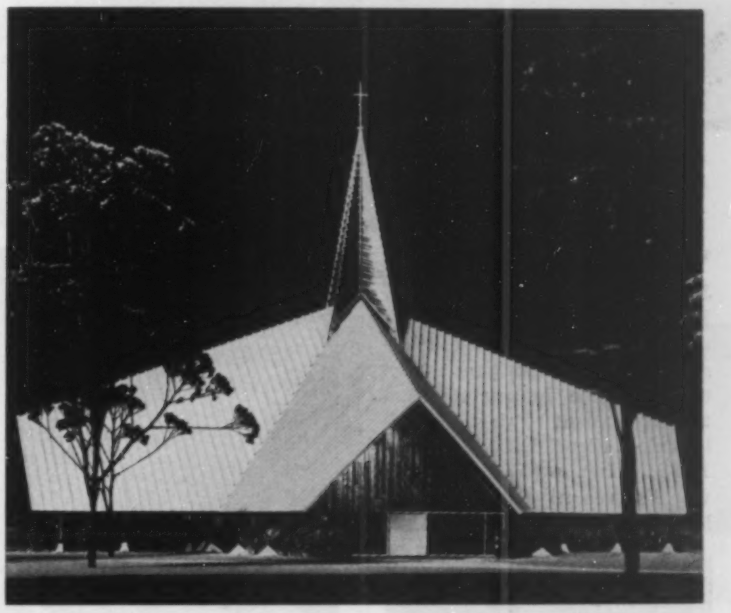
Projects

A roundup of recent and significant proposals

GILT-EDGED BANK

Judged by its appearance (below), Citizens State Bank in Oklahoma City will look impressively well-heeled. The 145-foot geodesic dome covering the bank's new quarters will be gold anodized Kaiser aluminum in 620 pentagon shapes. Inside, tellers' and officers' sections will be separated by plantings. Architects: Bailey, Bozalis, Dickinson, & Roloff, Oklahoma City.


CLIFF KING

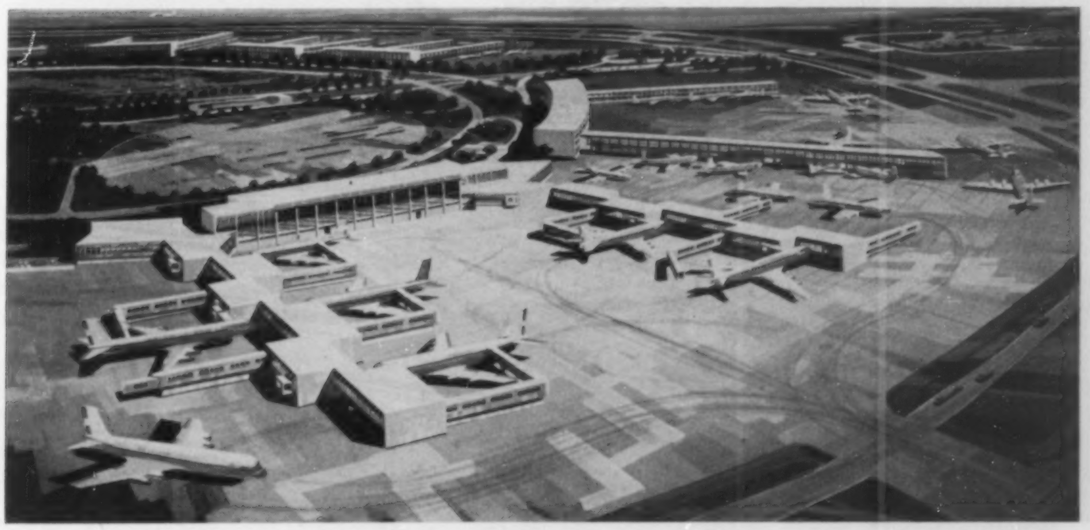


PHILADELPHIA DAY SCHOOL CHAPEL

Use the cross as the core of the design, and provide space for an organ. That was Architect Vincent G. Kling's mandate from the students of the Episcopal Academy, Overton Pa. How Kling answered these demands, which resulted from a student poll, shows up in the photo above. His Greek cross plan answers the first requirement, and there is indeed space for an organ. A special campaign is under way to raise $400,000 for the chapel—and for the all-important organ.

PLANES AND PASSENGERS IN PROXIMITY

Like TWA (p. 78), American Airlines will build a new terminal at New York's Idlewild Airport. This one, designed by Kahn & Jacobs, will cost $14 million and is to be completed by mid-1959. Passengers will step directly into planes from enclosed corridors (see photo below) which contract and pivot away from the planes after loading.



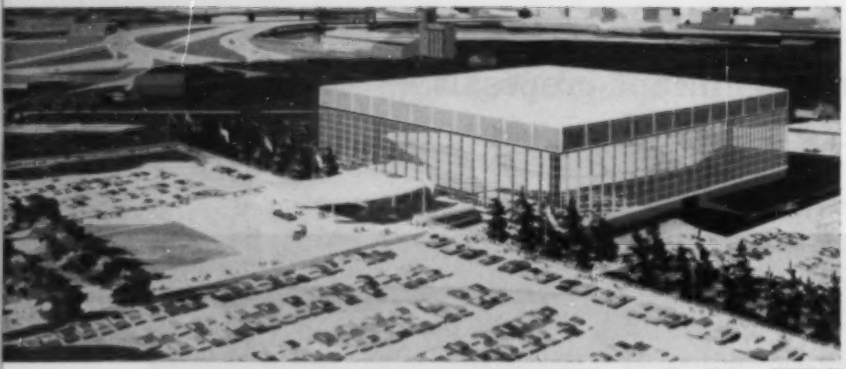


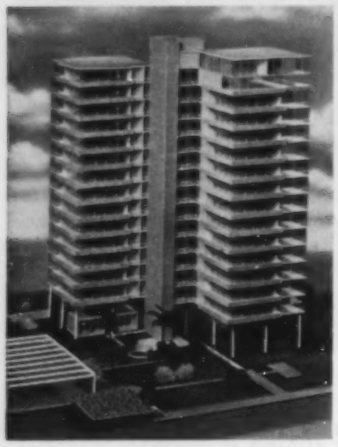
PHOTO-ART

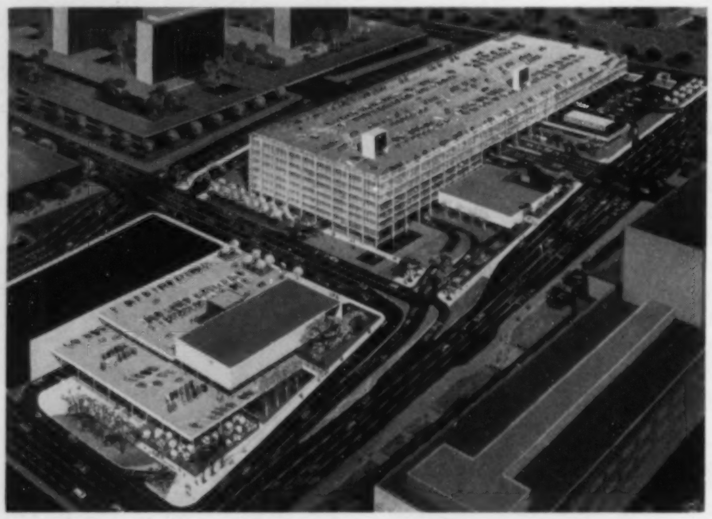
SHOWCASE FOR LUMBER

Wood plays a major part in the design for the Portland Oregon Exposition-Recreation Center. Skidmore, Owings & Merrill even use wood to span the 360-foot arena: laminated wood plate girders supported by laminated wood jack trusses. The exhibition hall will be recessed into the site to permit rooftop parking.

14-STORY LIFT SLAB

Joseph, Vladeck & Abraben, Miami Beach and New York architects, designed these 14-story glass-aluminum twin towers for a luxury cooperative apartment project in Hallandale Fla. Lift Slab of Florida, Inc. says it will set a world's record for lift slab height.



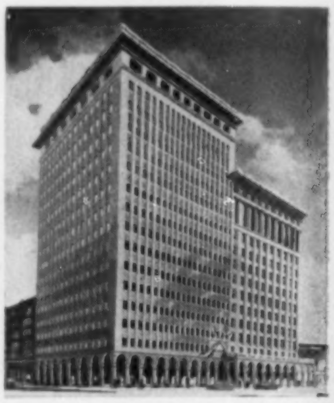


HUGE LOS ANGELES GARAGE

An immense 11-level public garage for 4,000 cars that would occupy almost two full blocks (connected at basement levels) has been proposed for the Los Angeles Civic Center. Private capital would build and operate the project under an arrangement by which it would revert to the city after the private investment is fully amortized. Victor Gruen & Associates are architects for the project, now under study.

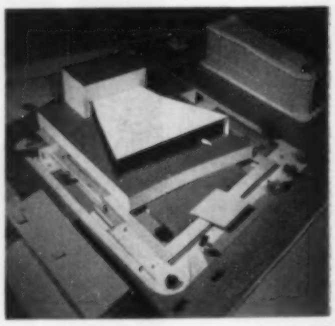
TEXAS LOOK-ALIKES

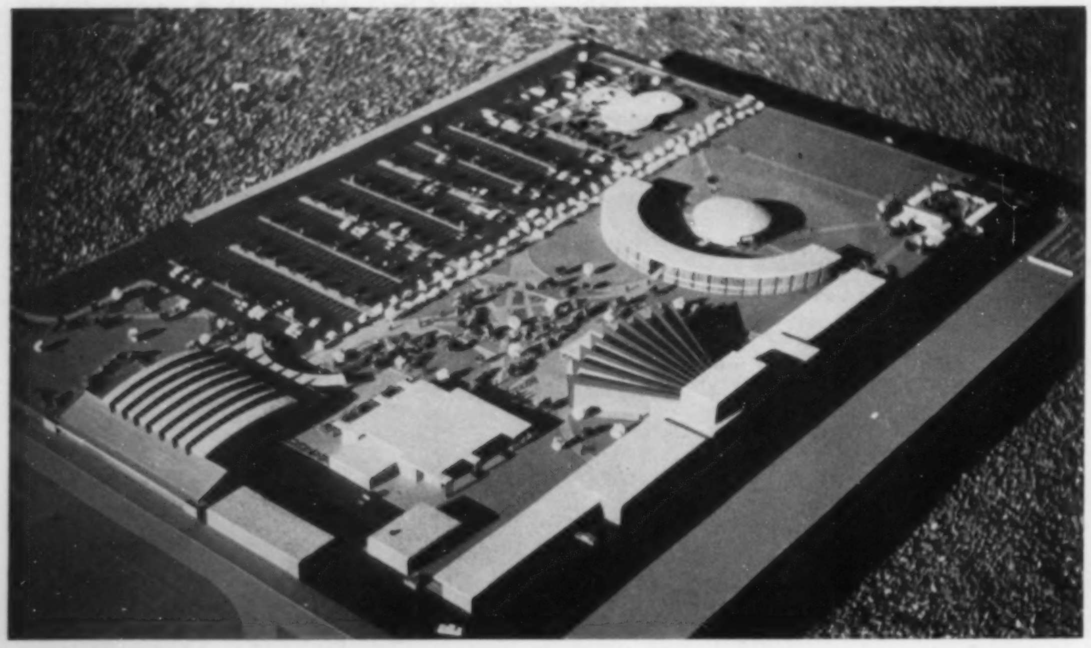
Designed to conform as closely as possible to the original Texas Co. building in Houston, the addition (left, below) will top it by three stories but is otherwise a close match. Architects: Kenneth Franzheim, Charles S. Chase, associates.


BOB BAILEY

VERSATILE AUDITORIUM

Toronto's 3,200-seat O'Keefe Auditorium will have the most flexible acoustic controls ever designed: walls made entirely of movable panels that can be adjusted to either absorb or reflect sound. Architects: Earle C. Morgan and Page & Steele, with Eggers & Higgins as consultants.


MAX FLEET



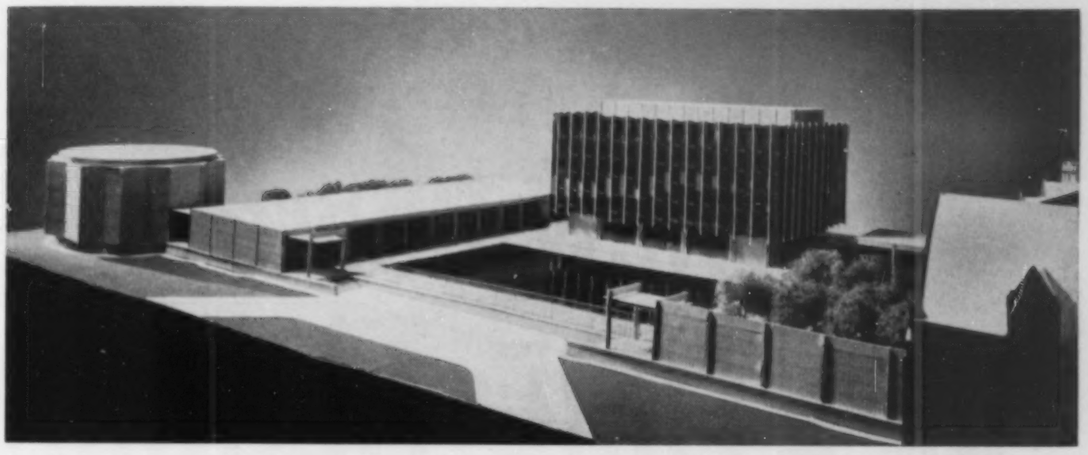
EXCEPTIONAL SCHOOL

An elevated passageway from the second floor of a crescent-shaped classroom building will be the only means for students to reach the circular library (r) 9½ feet above the ground at the Scottsdale Arizona High School. As designed by Phoenix Architect Mel C. Ensign, the crescent classroom building eventually will be expanded to full circle. Cluster of three smaller round administration buildings (top, center) will adjoin an 800-car parking field.

FIVE NEW COLLEGE BUILDINGS

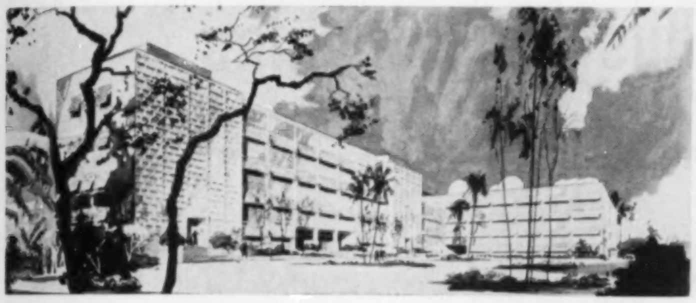
1. CHICAGO LAW SCHOOL

To accommodate rising student enrollment, the University of Chicago will replace its present law school with a roomier one (r.) Designed by Eero Saarinen & Associates, Bloomfield Hills Mich., the new law school will have a six-story main building, a smaller classroom and seminar unit, and an elliptical auditorium and courtroom. Cost: $4.1 million.



2. ART BUILDING

With the help of a $650,000 gift from the Steinberg Charitable Trust, Washington University of St. Louis plans to erect the art and archaeology building designed by Fumihiko Maki of the planning staff.

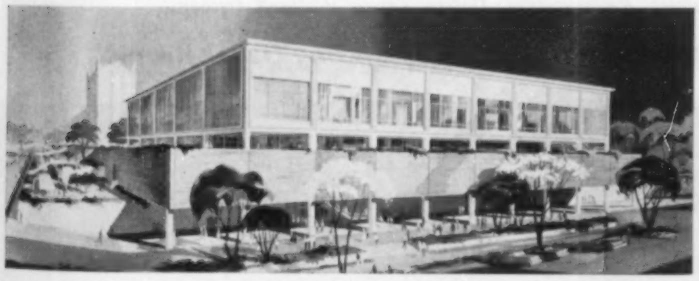


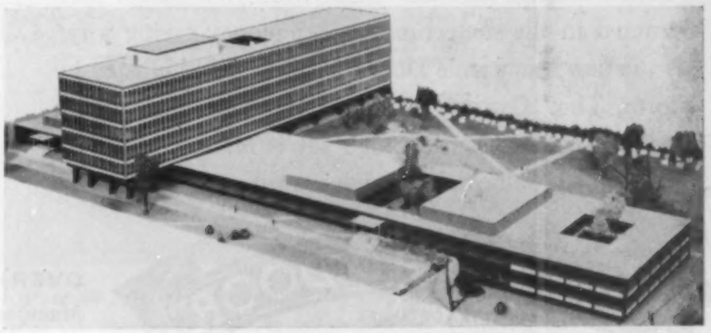
3. UCLA SCIENCE BUILDING

Several UCLA departments will share space in a second Engineering-Physical Sciences Building designed by Stanton & Stockwell. The $4 million building, which will house a computer center and penthouse meteorology lab, as well as administrative offices, is scheduled for completion by 1959.

4. UCLA STUDENT UNION

This $5 million completely air-conditioned four-story student union building was designed for UCLA by Welton Becket & Associates. Extensive facilities will include bowling alleys, billiard rooms, and a special food vending machine area. Its column-free hall will hold 3,000 dancers.



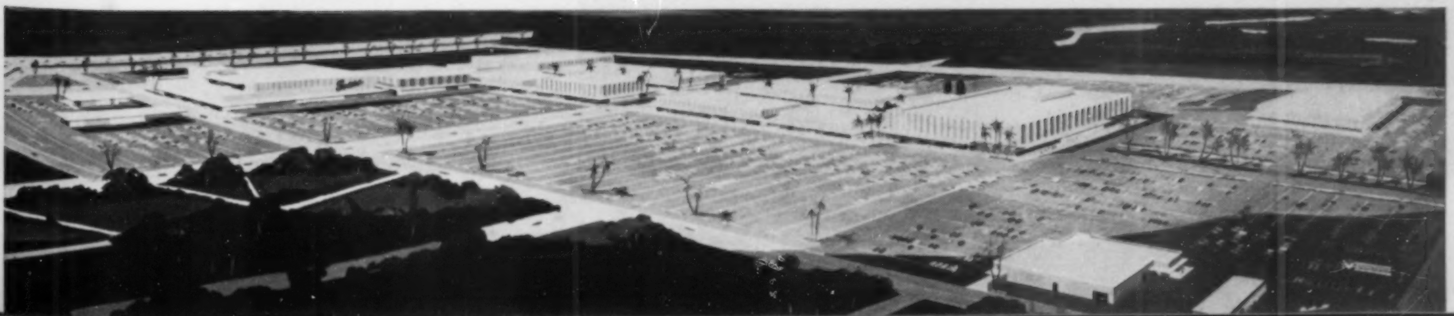


5. UNIVERSITY OF VERMONT MEDICAL COLLEGE

Since its founding in 1822, Vermont's College of Medicine has outgrown a succession of cramped quarters. Last October ground was broken for the first unit—a laboratory and clinical research building (extreme right above)—of a $7 to $8 million medical building in Burlington. Architects: Skidmore, Owings & Merrill; Freeman, French, Freeman of Burlington, associated architects.

WESTERN SHOPPING CENTER

Sears, Roebuck & Co. broke ground last month for the first unit in the $28 million Palma Ceia Shopping Plaza (below) in Hayward Calif. On completion this center will house 107 different tenants. The Urban Land Institute ranks it as the largest Pacific Coast regional shopping center, and the nation's sixth in store area. Eight thousand shoppers will be able to park at one time. David T. Johnson of Oakland is architect for the over-all development; Reynolds & Chamberlain of Oakland, architects for the Sears building.



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Now . . . magnificent doors of lifetime aluminum, built to your own specifications, can add functional beauty to the buildings that take shape from your plans! Constructed in the same time-saving, money-saving way* as the new Panoramic Door that has taken industry by storm, The "OVERHEAD DOOR" in lifetime aluminum has narrower stiles and rails, yet is far stronger than ever before. These doors weigh approximately the same as wood doors. Slightly greater initial cost is offset by the savings in maintenance! The gleaming anodized finish, inside and out, is permanent—never needs paint. Keyway construction permits easy replacement of components if damaged. For details of construction, sizes, special features, see pages 38-39, Sweet's Architectural Catalog $\frac{16\text{i}}{\text{Ov}}$ or write us for 56-page hard-bound catalog with traceable drawings.

*Patents Pending

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OVERHEAD DOOR CORPORATION, Hartford City, Indiana
Manufacturing Divisions: Hillside, N. J.; Nashua, N. H.; Cortland, N. Y.; Lewistown, Pennsylvania; Dallas, Texas; Portland, Oregon.

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◀ *New PANORAMIC Aluminum Door—handsome, maintenance-free, weathertight—blends beautifully with modern design—was an instant hit with the oil industry. Gives attendants full vision of traffic, parking areas and pumps.*

1957 A. I. A. Prize-Winning Design—Middlesex Mutual Trust Building at Waltham, Massachusetts, uses this special flush aluminum "OVERHEAD DOOR." Door shown opens into the receiving room of the insurance company's office building. Another door is in the basement garage. ▶

S **Architectural** $\frac{16\text{i}}{\text{Ov}}$

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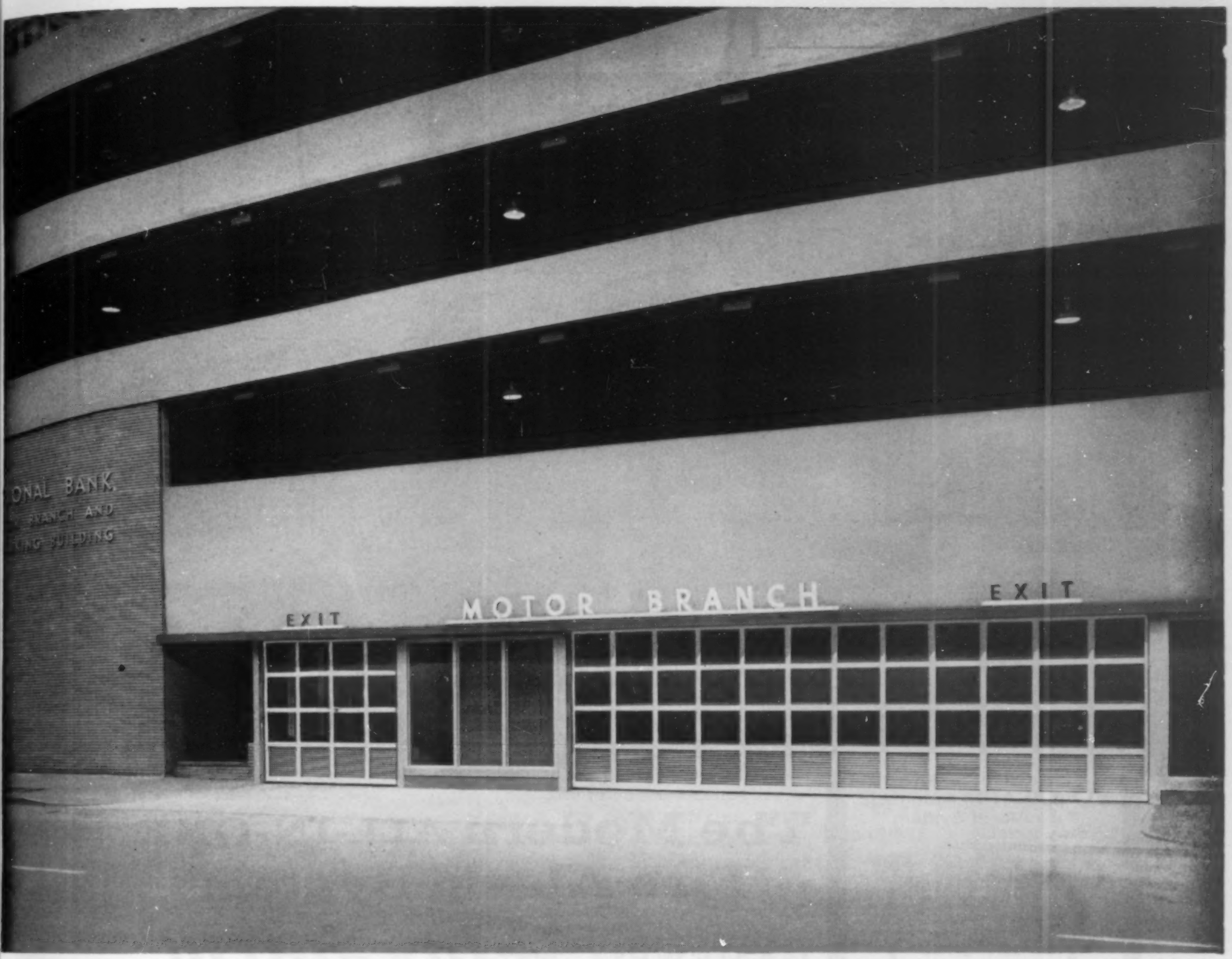
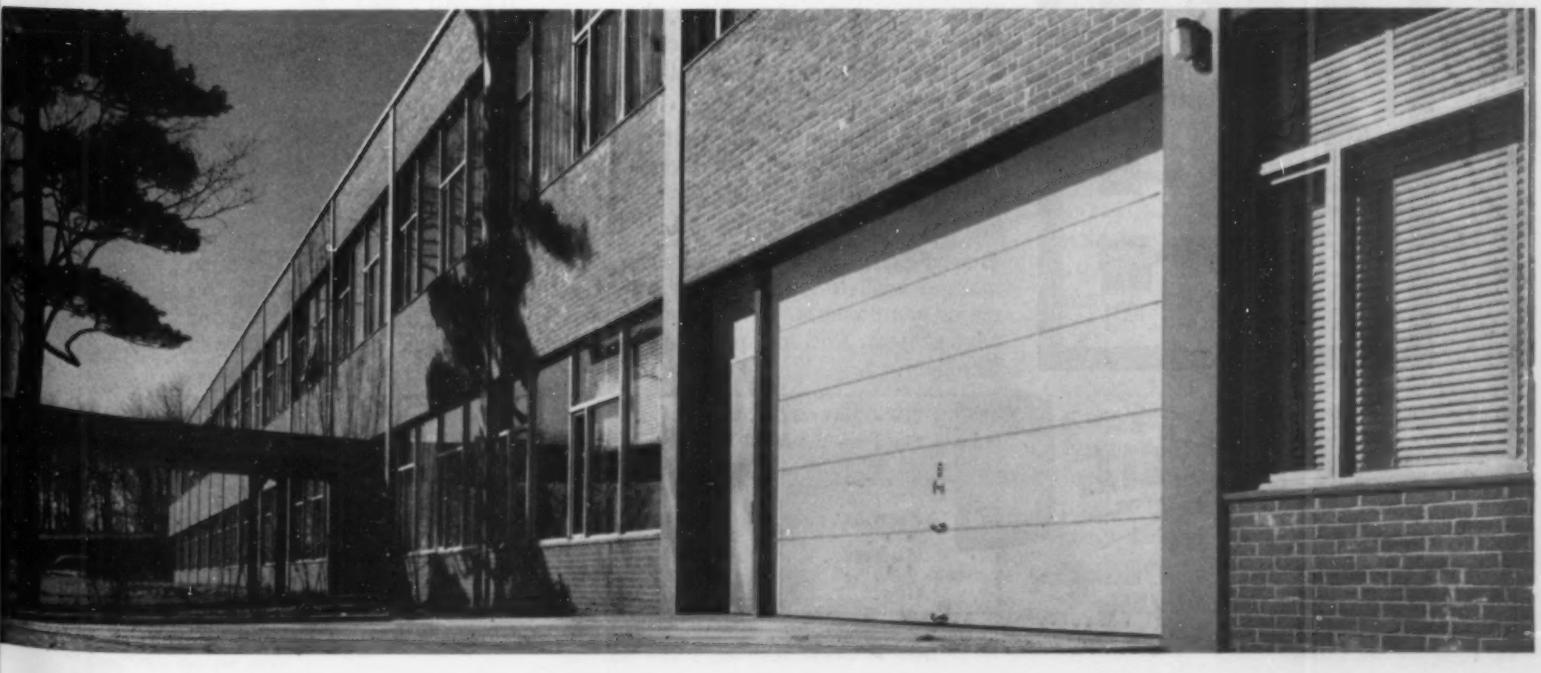

ONAL BANK
BRANCH AND
KING BUILDING
EXIT
MOTOR BRANCH
EXIT

*Merchants National Bank at Mobile, Alabama, provides drive-in facilities with the addition of a new Motor Branch and Parking Building. Two aluminum "*OVERHEAD DOORS,*" with bottom sections louvered to permit escape of exhaust fumes, give an attractive "store front" appearance to the building. The larger door, 26′9″ wide, is matched by a door of the same size and design on the entrance side of the building.* ⬆



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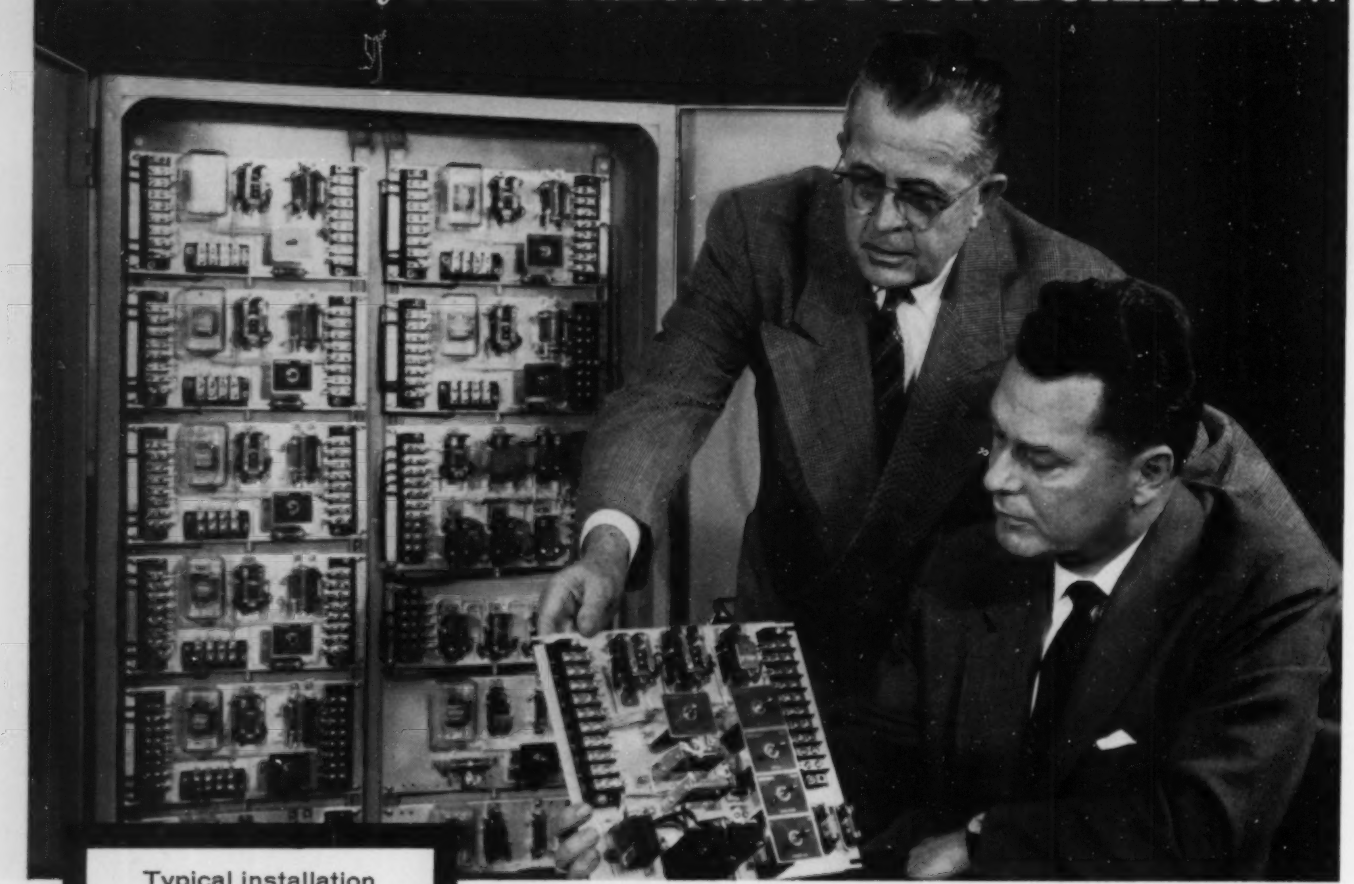
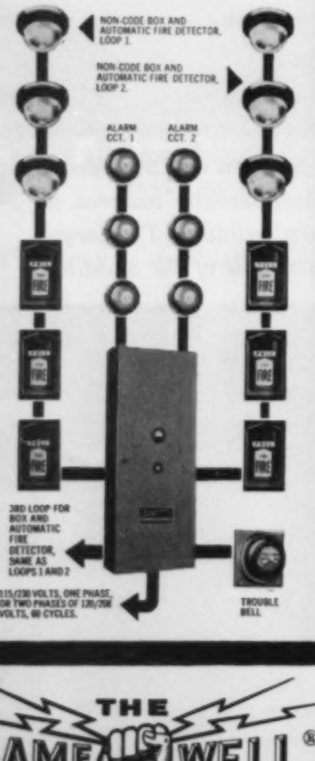


Typical installation
FLEXALARM Automatic
Fire Alarm System


NON-CODE BOX AND AUTOMATIC FIRE DETECTOR, LOOP 1.
NON-CODE BOX AND AUTOMATIC FIRE DETECTOR, LOOP 2.
ALARM CCT. 1
ALARM CCT. 2
FIRE
3RD LOOP FOR BOX AND AUTOMATIC FIRE DETECTOR, SAME AS LOOPS 1 AND 2
115/230 VOLTS, ONE PHASE, OR TWO PHASES OF 120/208 VOLTS, 60 CYCLES.
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Here, for the first time, is a completely pre-engineered fire alarm system . . . designed to give you new freedom and flexibility in specifications.

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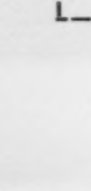
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Record building last year goes almost unnoticed as industry worries about economic downturn

BOX SCORE OF CONSTRUCTION

(Expenditures in millions of dollars)

		First 11 months		
	Nov. '57	1957	1956	±%
PRIVATE BUILDING				
Nonresidential	802	8,374	8,045	+4
Industrial	251	2,914	2,810	+4
Commercial	332	3,265	3,326	—2
Offices; lofts; warehouses ...	179	1,692	1,527	+11
Stores; restaurants; garages.	153	1,573	1,799	—13
Religious	78	794	697	+14
Educational	46	475	490	—3
Hospital; institutions	49	457	296	+54
Residential (nonfarm)	1,474	15,213	16,270	—6
Public utilities	539	5,358	4,700	+14
*PRIVATE TOTAL	2,950	30,618	30,588	**
PUBLIC BUILDING				
Nonresidential	361	4,130	3,748	+10
Industrial	32	423	408	+4
Educational	234	2,605	2,348	+11
Hospital; institutions	24	306	275	+11
Residential	55	450	262	+72
Military	110	1,190	1,297	—8
Highways	405	4,540	4,231	+7
Sewer; water	105	1,248	1,175	+6
*PUBLIC TOTAL.	1,164	12,942	11,928	+9
*GRAND TOTAL.	4,114	43,560	42,516	+2

* *Minor components not shown, so total exceeds sum of parts.*

** *Less than one per cent.*

If anybody doubted the fact, it is by now a virtual certainty: 1957 was the biggest building year ever. November's construction figures indicated a total for the year of around $47 billion, about 2 per cent better than 1956. (How much of this is attributable to higher prices isn't clear yet, but 1957 activity in terms of physical volume put in place probably wasn't more than a shade higher than 1956.

Also official is the anatomy of the 1957 record in building volume (see table, left). Total private building dollar outlays edged up a bare 1 per cent; most of the year-to-year gain was achieved through a 12 per cent increase over 1956 in public construction, largely state and local building. Public residential building (mainly Capehart Act housing on military reservations), administrative and service construction, highways and sewers showed the biggest 1957 gain in public construction.

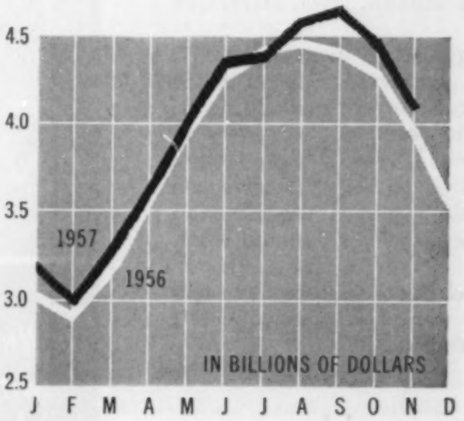
Perhaps the most striking thing about the new expenditures record is that so few people in the industry are paying much attention to it. Their indifference is understandable, however. They are already looking hard at 1958, and there are just enough dark clouds on the horizon to leave them a little apprehensive.

Most important indicator of possible trouble was the unemployment figure of 3.2 million in November. There had been some wary talk of perhaps 4 million unemployed by the first quarter of this year, but now some economists are raising their forecasts to 4 to 5 million jobless—and are saying the economic slide may last longer than first expected. So far, construction employment has held up better than manufacturing employment; recent figures for contract construction employment showed a drop of only 2.8 per cent behind late 1956 figures.

Also worrying economists—particularly those in Washington—is the dip in industrial production, now off 5 per cent from its December 1956 all-time high. And most of that 5 per cent drop came in October and November—the September figure was only slightly below the record high. The drop in current output, coupled with record spending for new plant in recent years, points up the danger of overcapacity in some industries, and consequent repercussions in the form of cutbacks in new plant and equipment spending this year.

There is little doubt now that capital spending is slowing down. A recent McGraw-Hill survey predicted a drop of 7 per cent in dollar spending this year from the 1957 peak. The latest SEC-Commerce Department survey of capital spending plans points to a drop of 5 per cent from the last quarter of 1957 to the first quarter of this year. Some economists are already saying that a drop of that magnitude so early in the year portends a drop of more than 7 per cent for the full year. The National Industrial Conference Board quarterly survey also indicates a drop in capital spending this year. In the third quarter of last year, the 1,000 largest manufacturers appropriated 31 per cent less money for expansion, compared with the same quarter of 1956. And backlogs (funds already appropriated but not yet spent) declined 11 per cent in the quarter.

The slowdown in capital spending already has affected industrial real estate. Last year, tight money held up some projects. In recent weeks, there has been some evidence that some projects postponed for money reasons are now being canceled. The Federal Reserve Bank of Philadelphia notes that "although many companies are still inquiring about both large and small tracts, the trend of actual (plant site)



TOTAL EXPENDITURES for new construction were $4.1 billion in November, 4 per cent above November 1956. For the first 11 months, activity was 2 per cent ahead of 1956.

continued on page 45

Adjustable header duct junction units move up or down to screed level ...cut installation time, assure a level finished floor

National Electric has developed an easily adjustable junction unit ring for its Header Duct Steel Underfloor Raceways.

The new Header Duct junction unit ring is designed to eliminate the raised spots and depressions that occur when underfloor raceway junction boxes protrude above or become recessed in the floor due to minor variations in the level of the concrete. Adjustment of three easily accessible flush screws in the cover of the unit is all that's required to level the ring with the concrete surface ... assures a smooth, level, attractive finished floor.

National Electric junction unit rings can be moved down as well as up after the concrete has set. A galvanized steel collar around the junction unit ring keeps concrete from bonding to the ring and preventing a downward adjustment.

The newest Header Duct improvement is typical of how every detail in NE Header Duct is engineered to help you give the owners and tenants complete flexible electrical distribution for power, light, communication or telephone—where and when it's needed.

When the plans call for cellular steel floors with feeder raceways from distribution panels make sure NE Header Duct, with adjustable junction units, are specified.

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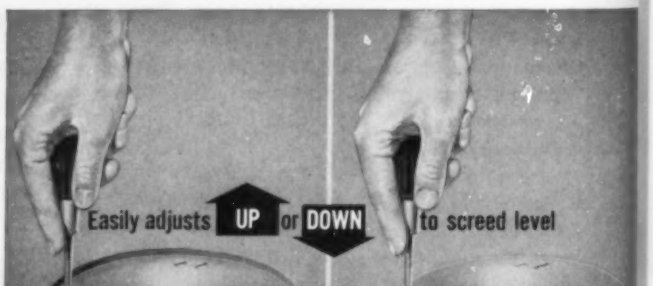
2 Plants • 12 Warehouses • 41 Sales Offices



Where you plan cellular steel floors with underfloor electrical distribution always specify

NE HEADER DUCT

sales suggests that industry is taking another look at its future expansion needs before making final decisions." While the Philadelphia Fed hesitates to call its findings a clear-cut trend, it adds this cautious observation: "Perhaps the most that can be said of the present situation is that industry seems to be taking a more leisurely view of its future expansion needs in a period when the business climate contains elements of uncertainty."

In the face of the slowdown in capital spending, over-all spending for construction this year still looks as good as it was in 1957. Contract awards for both residential and nonresidential building were running ahead of 1956 by 11 per cent and 5 per cent respectively late last year. FORUM consultant Miles L. Colean says, "events since August (when the FORUM forecast for 1958 was prepared) appear to justify a brighter rather than a duller outlook."

MISCELLANY

Housing census reveals 2.7 million more dwelling units built since 1950 than earlier figures show

Overnight the nation seemingly became richer by some 2.7 million housing units. At least that is what the preliminary figures of the Census Bureau's 1956 housing inventory suggested. According to this inventory, a total of 10.9 million new units were added to the nation's stock of homes between April 1950 and Dec. 1956. This is 2.7 million—or a full third—more units than the total figure for nonfarm housing starts through the same period compiled by the Bureau of Labor Statistics. The largest discrepancies appear in figures for nonmetropolitan areas (Census figures are 83 per cent larger than BLS figures for the 6¾-year period) and particularly areas in the South.

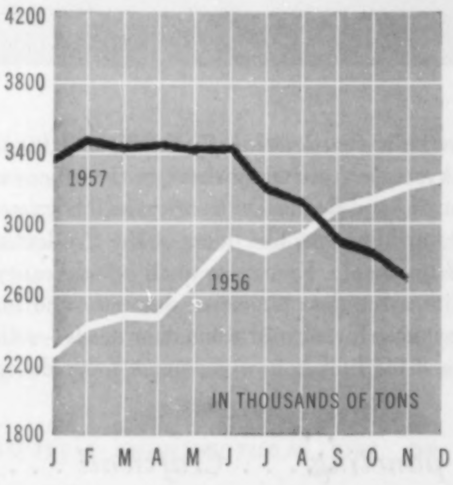
One reason for the great difference in the two totals is readily apparent. BLS, using building permit applications, estimates housing starts for new, permanent, nonfarm units, plus seasonal units that are equipped for year-round occupancy. The Census Bureau simply goes out and counts all housing units (on a sampling basis), including trailers, shacks, units built without permits. Trailers and farm dwellings alone account for 200,000 and 600,000 units respectively of the discrepancy between BLS and Census Bureau figures.

But this still leaves a difference of 1.9 million units—too much to be accounted for entirely by shacks and seasonal dwelling units. It raises questions about the sampling methods of the Census Bureau, and more particularly about the whole system of using building permits as a source of information on housing construction.

The latest count of dwelling units indicates there may have to be some revisions in figures on gross national product, too. If figures on housing units themselves have been underestimated all along, then figures on the value of housing included in this output index have likewise been underestimated.

The Census Bureau's housing inventory shows a stock of 55.3 million units, a net increase of 9.3 million since April 1950. It also reveals that vacancies are slightly greater than have been indicated by the BLS quarterly Housing Vacancy Survey. The inventory shows that total vacancies were 9.9 per cent of all units in December 1956, while the survey estimated only 8.6 per cent at that time. While these figures are obsolete by now, they indicate that current survey figures may be too low.

The Census Bureau and BLS are currently thrashing over their figures to find the reason why they differ so much. It could lead to some revisions in current methods of reporting new housing activity.



BACKLOG of unfilled orders for fabricated structural steel totaled 2.7 million tons on Nov. 1, or about 17 per cent below 1956 level.

BUILDING MATERIALS

Cement, structural steel seen easier this year

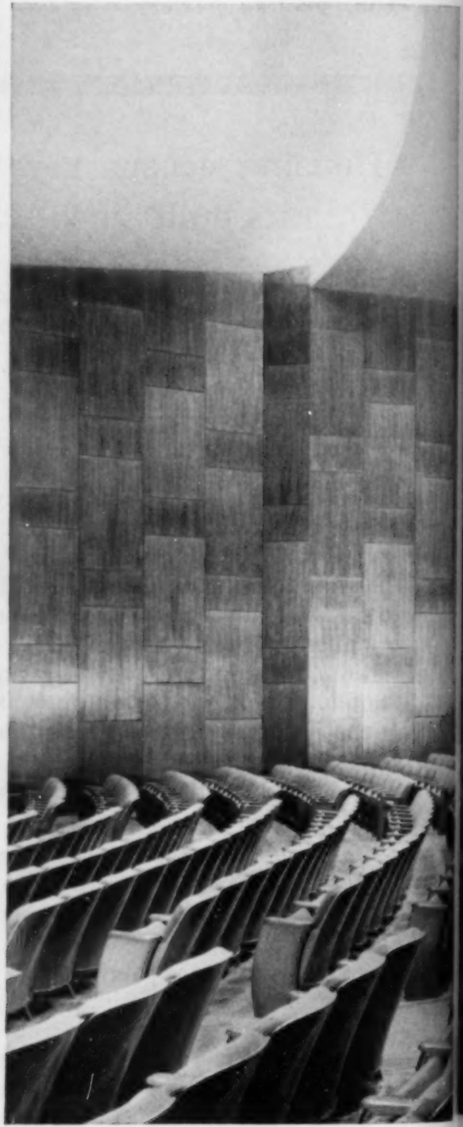
As the construction industry headed into 1958, the building-materials picture looked brighter than at the start of any year since the Korean War—that is, if you are a buyer of materials. For one thing, materials prices generally seemed to have leveled off. The Bureau of Labor Statistics reported that the all-building materials index had stayed at around 130.2 (1947 to 49=100) in November, marking over a year without any strong movement up or down. For another, two materials which have been in short supply showed definite signs of easing:

Cement. Most cement producers rushed to expand their capacity two or three years ago when the federal highway bill began to firm up. But their wave of expansion came at a time when the highway builders were not moving so fast as had been anticipated. At the same time, demand from some parts of industry slacked off. The result has been worrisome inventories and fears of overcapacity. Although no one in the industry has said he was sorry he expanded, a few producers are doubtful about the immediate future. H. A. Sawyer, president of Lone Star Cement Co., largest independent producer, recently said that his company was not planning to raise prices at all early this year. A few companies have raised prices, but mostly in the West and South where heavy inventories are not so big a problem as in the East. It had been expected that cement prices would rise 15¢ to 25¢ per barrel following last summer's five-week strike.

Structural steel. According to a spokesman for the American Institute of Steel Construction, "structural steel is now readily available for the entire construction industry." He estimates output of structural shapes at around 6.7 million tons this year, a new record and 25 per cent ahead of last year (FORUM, May '57). Bookings and shipments are in a more "normal balance," he said. (Bookings through Nov. 1, 1957 were 39 per cent below the year previous, while shipments had risen 15 per cent.) And structural steelmaking capacity is still expanding at a fast clip; more than 1 million additional tons are expected to be ready by early 1959.

Design ideas really come to
when you call on the

RODDIS DOORS ***for Chicago's Prudential Building*** — 2100 of them were used in this great skyscraper, including those in the offices of Household Finance Corp., pictured here. Roddis Doors are available *primed and sealed* for protection, finer finishing—or, like doors of the Prudential Building, *completely prefinished* to sample. Famed for quality and beauty, Roddis Doors aid creativity with a limitless choice of domestic and imported woods. Roddis offers *one* source for all your wood door needs—solid and B-label fire doors, guaranteed for life; hollow core and X-ray doors.



RODDIS HARDWOOD PANELING graces Johns Hopkins University's Shriver Hall. (Buckler, Fenhagen, Meyer and Ayers, Architects.) Choice, hand-selected walnut veneers of rich grainings, painstakingly sanded to flat smoothness, make this Roddis

Doors . . . hardwood paneling . . . Craftwall . . . fine woods for every application. For over 60 years, Roddis has been working with America's leading architects.

life
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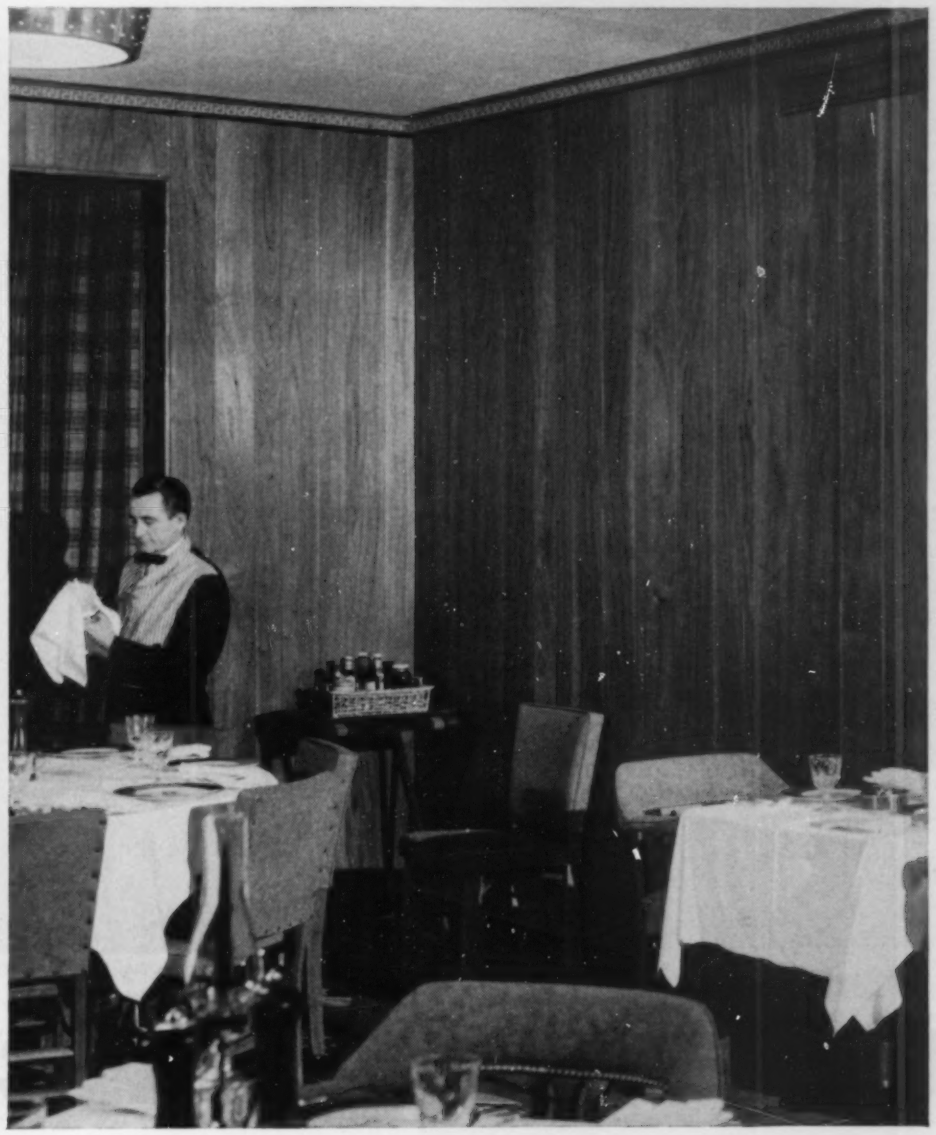


installation exceptionally beautiful. You'll find a vast variety of woods in standard panels to fit your ideas quickly. *Custom* panelings? Roddis is a specialist in this area . . . able to provide practically any design in wood with beautiful veneers perfectly matched for the desired effect.

RODDIS CRAFTWALL paneling in Rib Room, Hotel Roosevelt, New York, gives diners home-like warmth. Professionally prefinished, Craftwall has a rich, hand-rubbed look. Resists scuffs, stains and dirt. Ideal for any installation, commercial, institutional or home. Nine woods provide broad design possibilities: maple, cherry, elm, birch (2 tones), oak, mahogany, walnut, knotty pine. The ¼″ panels come in standard sizes, special sizes, and in fire-retardant construction. Roddis guarantees Craftwall wood paneling in writing for the life of the installation.

FOR FURTHER INFORMATION SEE *SWEET'S ARCHITECTURAL FILE*, OR WRITE TO

RODDIS PLYWOOD CORPORATION, MARSHFIELD, WISCONSIN

John Jay Junior-Senior High School, Cross River, N.Y. Architects: Ketchum, Giná & Sharp, New York. Structural Engineers: Severud-Elstad-Krueger.

A Lupton aluminum curtain-

helps sustain a single design theme throughout eight

The new $1,700,000 John Jay High School in New York's Katonah-Lewisboro district is a monument to the determination and pride of a community. And, with its completion, the project also becomes an indication of what architects can accomplish with a low-cost and versatile LUPTON curtain-wall system.

At the outset, it was obvious that each building would present particular planning problems of its own (see illustrations at right), yet it was esthetically desirable that the school—taken as a whole—retain a continuity of design. A most satisfactory combination of beauty and economy was found in aluminum curtain-wall construction.

Imaginative use of LUPTON aluminum projected window components and insulated porcelain-enameled panels enabled the architects to incorporate the required combinations of vision, natural lighting, and ventilation in their designs without destroying the relation of each building to its neighbors. Moreover, this was accomplished within the Trustees' original budget.

The versatility and design flexibility of LUPTON aluminum curtain-wall systems make an investigation worth your while. They save money, go up fast (usually from *within* the building, without scaffolding), and permit creative freedom for far less than you'd think. By leaving the entire job to LUPTON—including erection by swift, skilled LUPTON crews—you can effect even greater savings.

Photographs by Continental Air Views and Joseph W. Molitor.

wall system

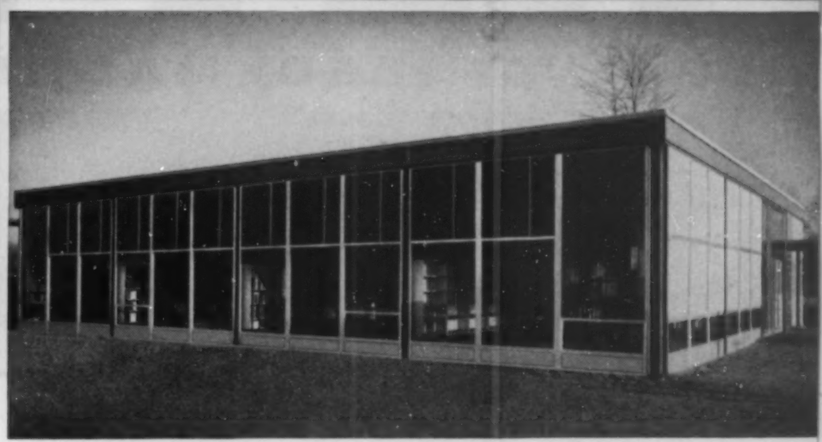
dissimilar buildings

See Sweet's (Sections 3 and 17) for the Michael Flynn Curtain Wall and Metal Window Catalogs, and write to us for further information. For fast action, look up the LUPTON representative in your Yellow Pages, under "Windows-Metal."

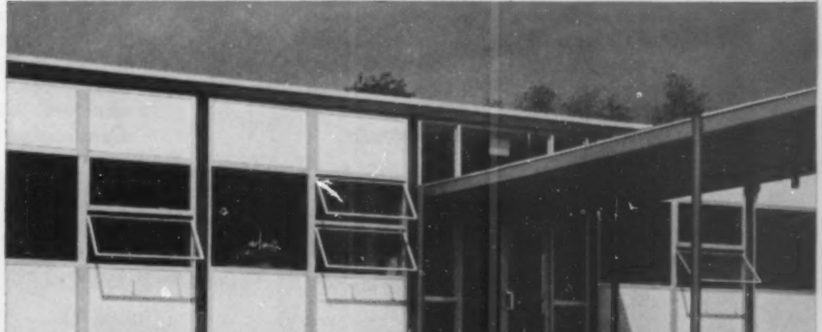
LUPTON

METAL WINDOWS • CURTAIN WALLS

MICHAEL FLYNN MANUFACTURING COMPANY
MAIN OFFICE AND PLANT: 700 E. GODFREY AVE., PHILA. 24, PA.



ABUNDANT NATURAL LIGHT was wanted for this north wall of the John Jay library. LUPTON aluminum projected windows were selected and delivered ready for installation. Good-looking, rugged, and simple to put up, they provide light and maximum controlled ventilation to this outstanding building.



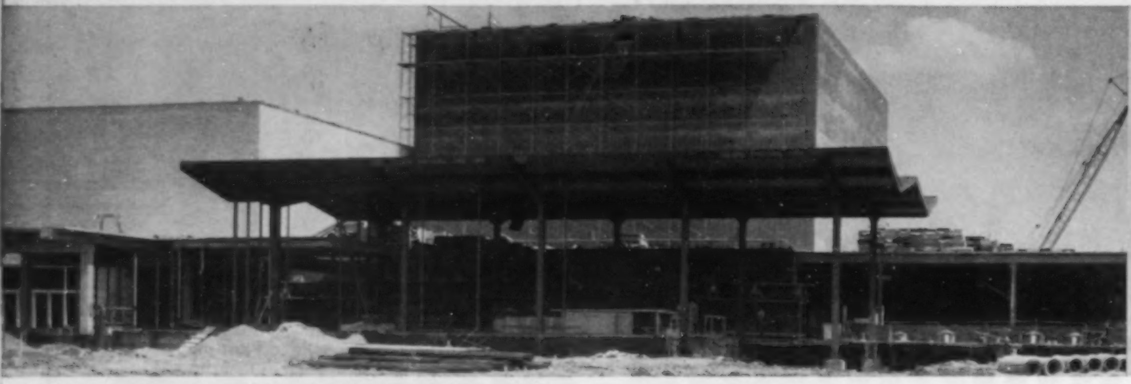
GLASS BALANCED WITH OPAQUE PANELING for classrooms. Here, natural lighting was neither practical nor desirable, and custom-engineered, insulated porcelain-enameled panels by LUPTON were specified for their beauty and thermal insulation value. The LUPTON windows open for air and for cleaning from the inside.

"Keywall exclusively!" That's the decision of Victor DeSantis (right), vice president of the R. S. Ursprung Company. Vito DeSantis (left), job superintendent on the new Retread Plant of Firestone Tire & Rubber Company, agrees, as they inspect the job with Bob Scheuer, president, Lakewood Supply Company, local distributor of Keywall.

Keywall preferred by The Sam W. Emerson Co., Cleveland, for the Museum of Natural History, Cleveland. Approved by Garfield, Harris, Flynn & Williams, architects.

Cleveland goes "all out" for KEYWALL

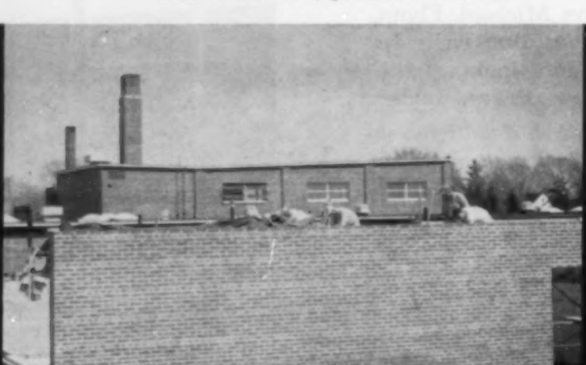
GALVANIZED MASONRY REINFORCEMENT



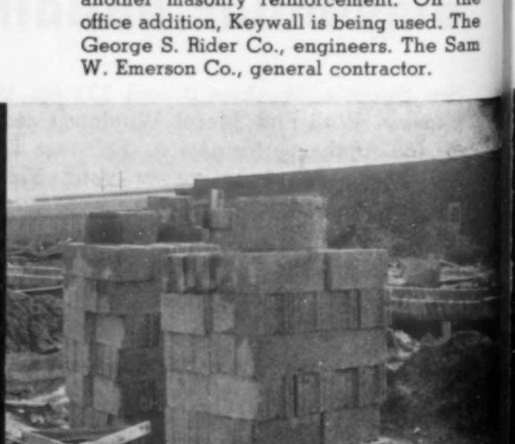
Keywall used exclusively in this large retail store of the May Co., Cleveland. Victor Gruen & Associates, Detroit, architect. Jack A. Bialosky, Cleveland, associate architect. The Sam W. Emerson Co., Cleveland, general contractor.

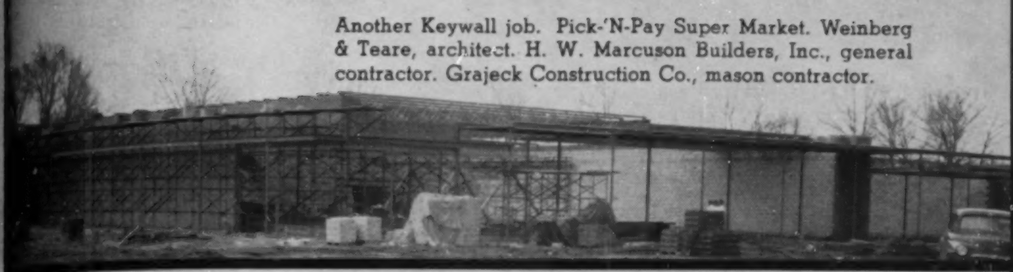
On this Warner & Swasey Co. warehouse, Keywall was used in alternate courses. Pilasters were on 16 ft. centers with expansion joints. Walls—18′-0″ high. Joseph Ceruti and Associates, architect. The Leonard H. Krill Co., general contractor.

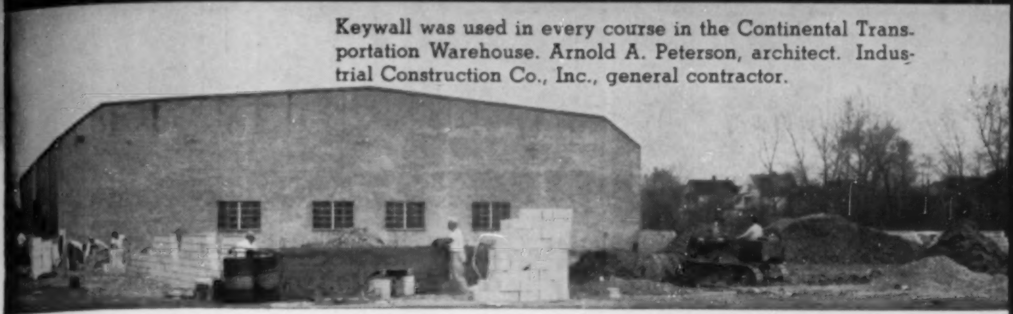
Typical Cleveland specification—Keywall in alternate courses. Olmstead Falls High School. Mellenbrook, Foley & Scott, architect, Berea. Barber, Magee & Hoffman, structural engineer. The Hoelzl-Martini Construction Co., general contractor.



Keywall takes over. On the Lamson & Sessions Factory, Keywall was tested against another masonry reinforcement. On the office addition, Keywall is being used. The George S. Rider Co., engineers. The Sam W. Emerson Co., general contractor.




Another Keywall job. Pick-'N-Pay Super Market. Weinberg & Teare, architect. H. W. Marcuson Builders, Inc., general contractor. Grajeck Construction Co., mason contractor.

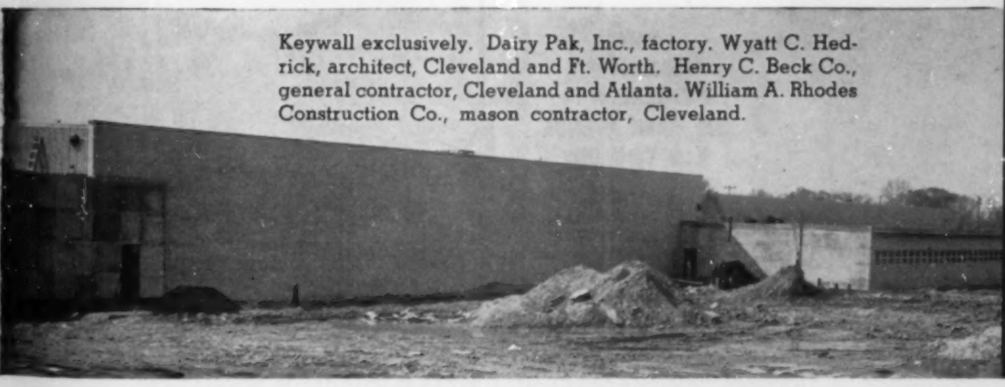

Keywall was used in every course in the Continental Transportation Warehouse. Arnold A. Peterson, architect. Industrial Construction Co., Inc., general contractor.

Contractors prefer... architects approve... new type masonry reinforcement

Visit the better masonry jobs around Cleveland. Go on the scaffolds. Talk to the bricklayers. Talk to the superintendents. Never before a reinforcement like Keywall, these men agree. Architects like it because they know that when masons like a product, *they'll use it*, and use it right.

Here are a few of the current jobs where Keywall is adding strength, reducing shrinkage cracks and giving greater value.

KEYSTONE STEEL & WIRE COMPANY
Peoria 7, Illinois

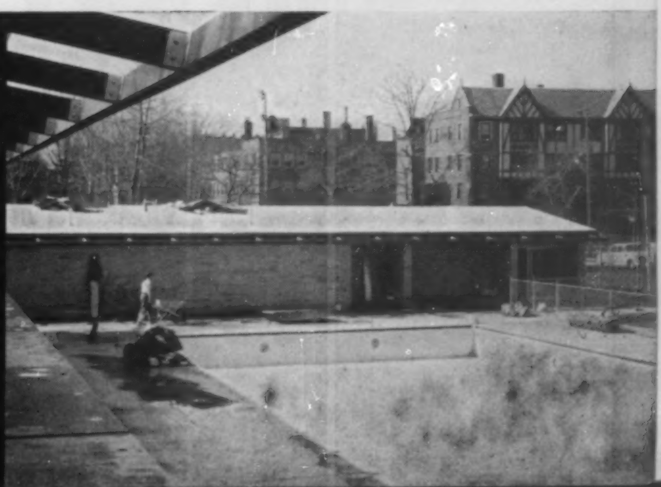

Keywall exclusively. Dairy Pak, Inc., factory. Wyatt C. Hedrick, architect, Cleveland and Ft. Worth. Henry C. Beck Co., general contractor, Cleveland and Atlanta. William A. Rhodes Construction Co., mason contractor, Cleveland.

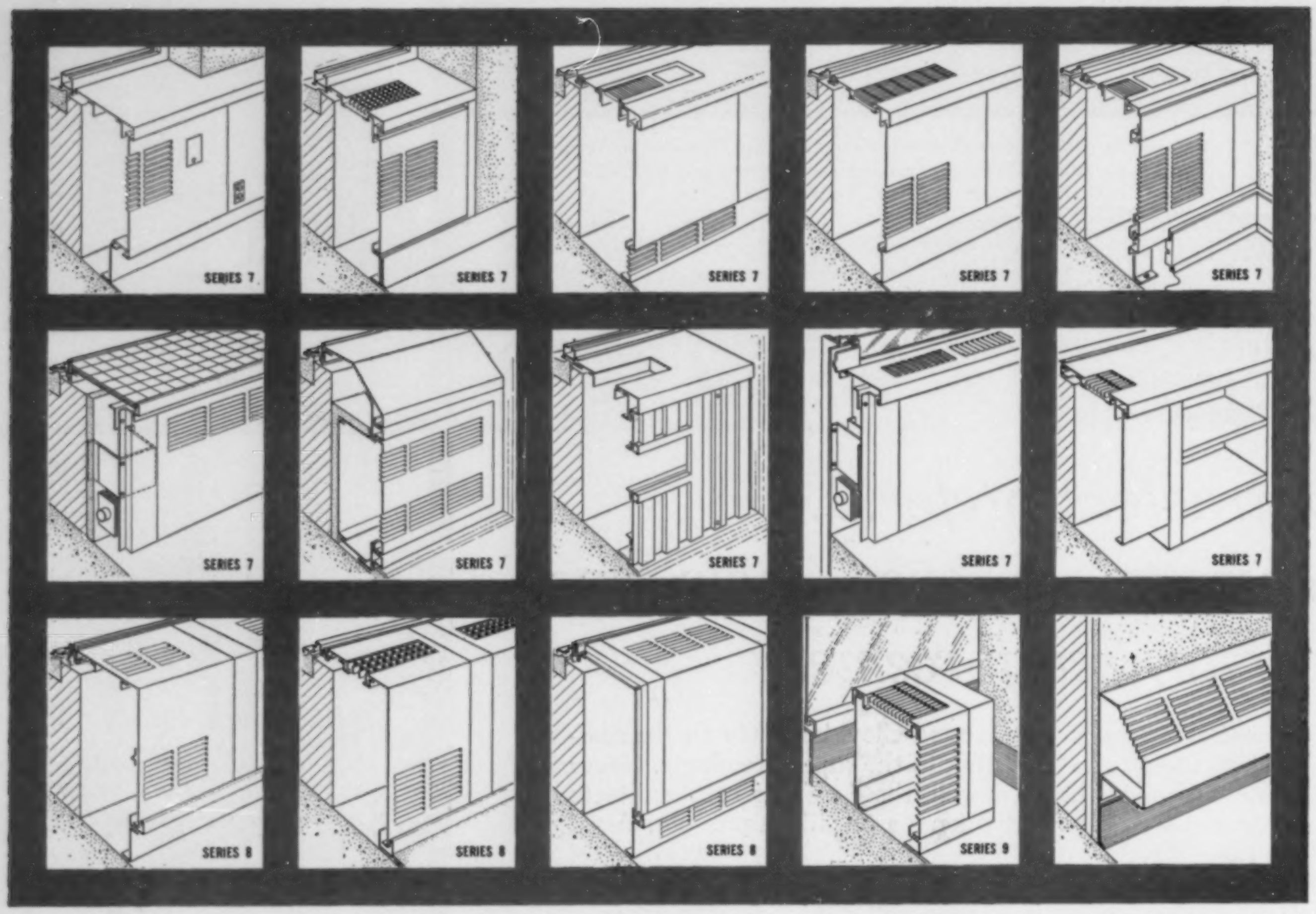
(Top) Keywall preferred and used. Westlake Christian Church. Travis Gower Walsh & Associates, architect. R. L. Williams, associate architect. Dunlap & Johnston Inc., general contractor.

Keywall used in alternate courses. Vermilion-on-the-Lake High School. Outcalt Guenther & Associates, architect. Tom Hume, general contractor.

Keywall replaced wall ties on the Holy Ghost School. With glazed tile walls, Keywall was used in every third course. With solid 12 inch brick walls, Keywall was used in every sixth course. Nicholas Lesko, architect. Leo W. Schmidt, general contractor.

An exclusive Keywall job. Lakeshore Hotel Cabanas and Pool. Snyder & Tekushan, architect. The Westwood Construction Co., general contractor.

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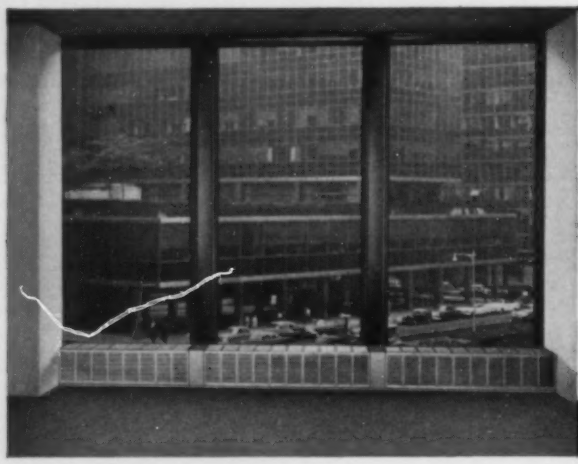
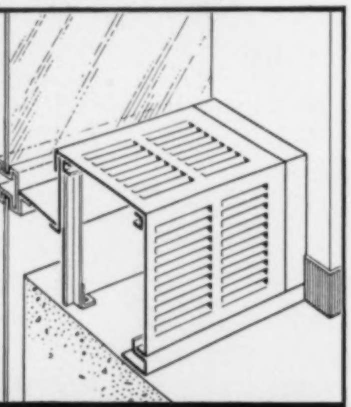
UNLIMITED DESIGN VARIATIONS AND FLEXIBILITY



POMEROY
ENCLOSURE
INSTALLATION IN
375 PARK AVENUE
New York City

ARCHITECTS:
Mies van der Rohe & Philip Johnson
ASSOCIATE ARCHITECTS:
Kahn & Jacobs
GENERAL CONTRACTORS:
George A. Fuller Co.



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CUSTOM-BUILT ENCLOSURES
for air-conditioning and blender units • convectors • radiators

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DOUBLE-HUNG WINDOWS	360° REVERSIBLE WINDOWS	FIXED and HINGED WINDOWS	CUSTOM-BUILT ENCLOSURES	CURTAIN WALLS	ACOUSTICAL CEILING SUSPENSION SYSTEMS

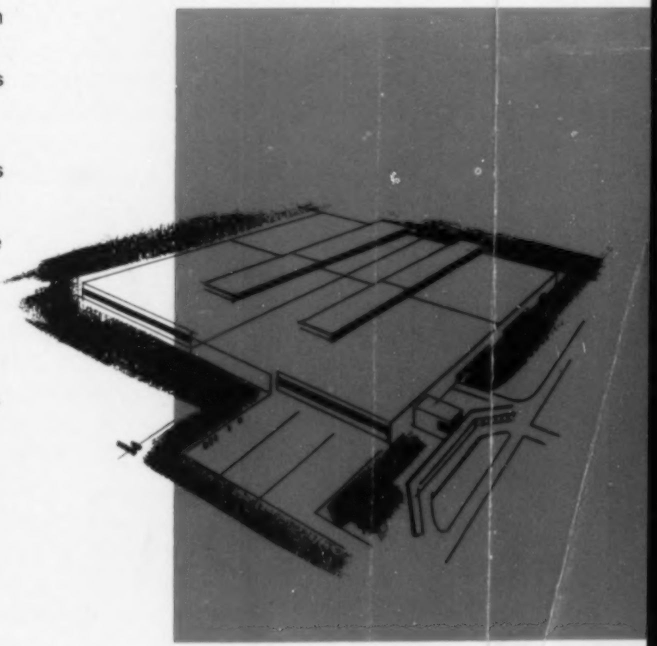
FABRICATION IN ALUMINUM—STAINLESS STEEL and COATED STEEL

SEVEN SUGGESTIONS FOR BETTER BUILDING

7

OFFERING VERSATILE TECTUM...

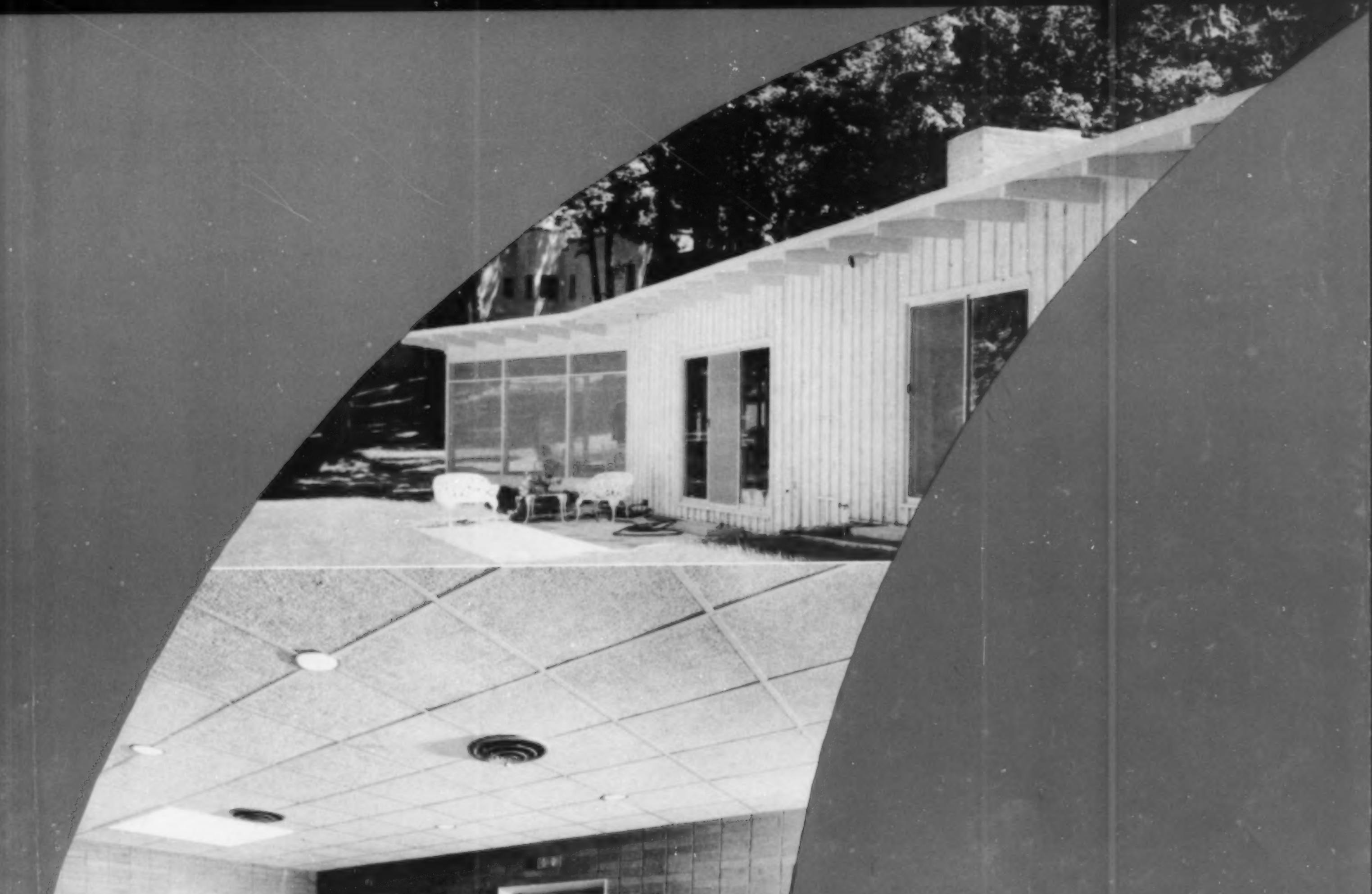
1957 . . . with the stock market fluttering from high to low and back to an all-time high, with building construction showing signs of weakness in certain areas, Tectum was chalking up the best year in its history. The infant was coming of age. The new plant located in Arkansas, due to be finished by the end of the year, was badly needed by late fall. More and more applications were being found for this versatile material. Architects, engineers and builders found new values, new ways to keep building costs in line with the times, and the ways in which Tectum could be used rapidly multiplied.

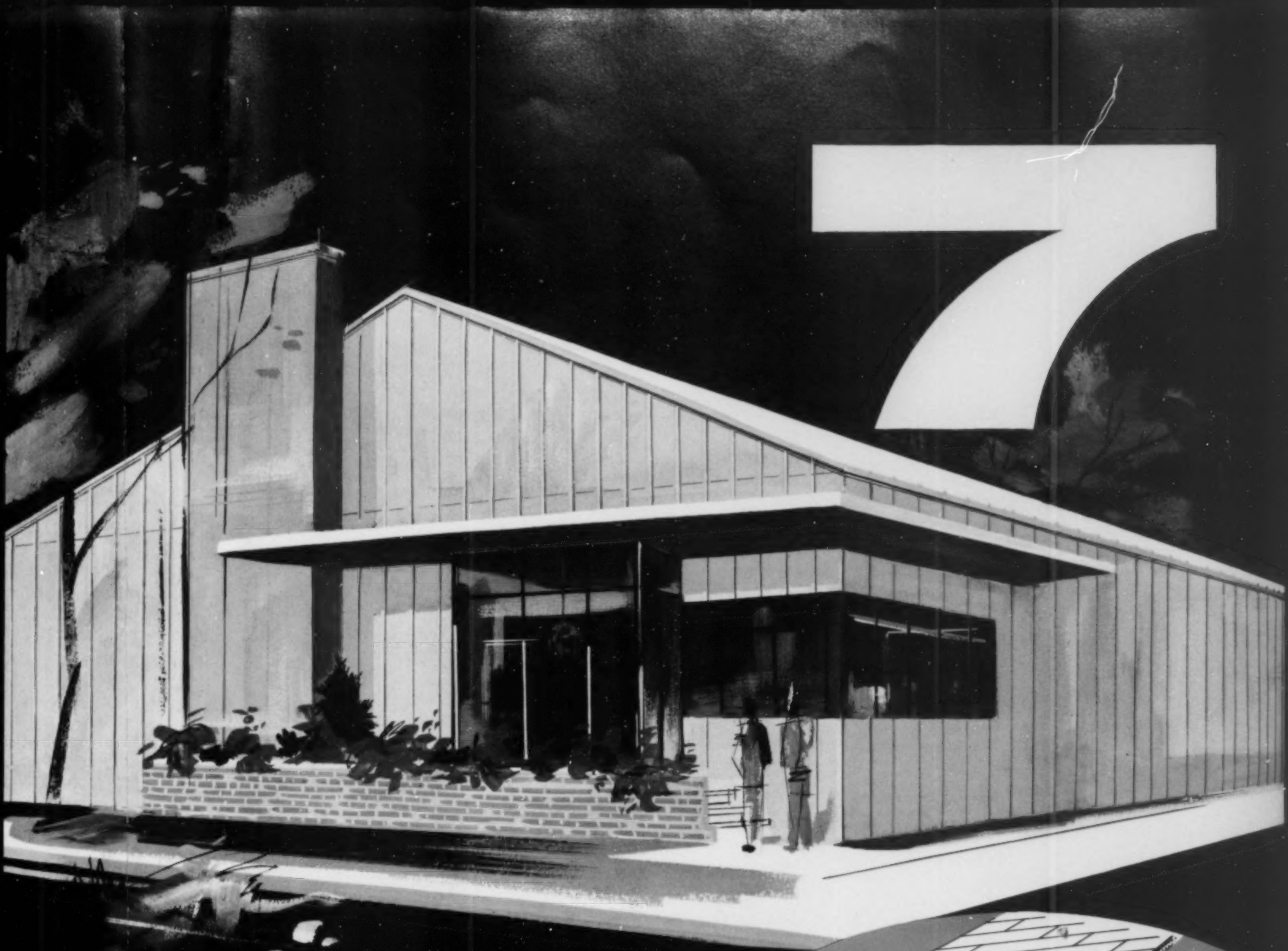


Many of the ideas suggested on the following pages are not new in the strictest sense—it is only that they have not been considered standard applications while the supply of Tectum was limited. They offer the same versatility, the same cost-reducing features that have made this material one of the leading roof deck materials. If you have had difficulty in the past obtaining Tectum, try us today. Three times as much Tectum is now available. Twice as many field representatives—architectural representatives, sidewall and roof deck distributors, building supply distributors, acoustical applicators, and factory-trained sales engineers—are ready to help you know more about this material and its unlimited application possibilities.

Remember, there is MORE TECTUM for roof decks, sidewall and all standard applications with which you are familiar . . . MORE TECTUM for new applications as illustrated on the next few pages . . . MORE TECTUM in new form for new uses still in the research and development stage.

FOR SEVEN NEW APPLICATIONS

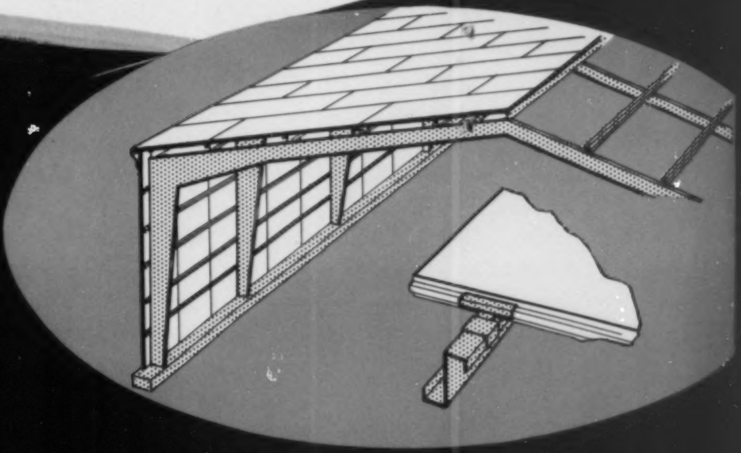


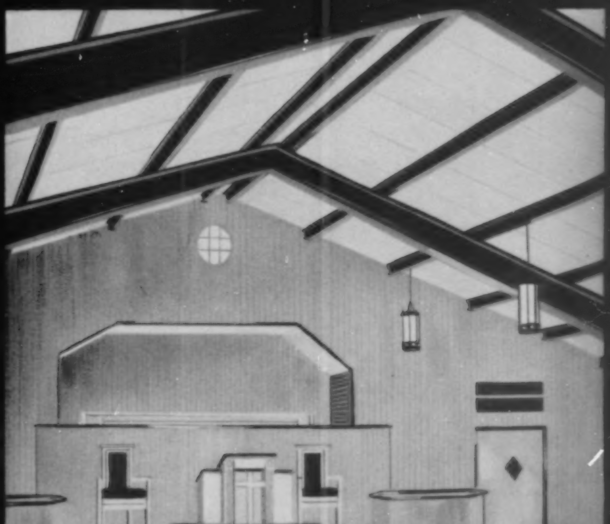


Look what's happening in metal buildings

These are metal buildings . . . ? yes, indeed. Gone are the days when the steel building was relegated to storage shed and farm building classifications. Architects and builders know that when they design around a basic steel structure for commercial, industrial, office or similar structures, and add versatile Tectum as an insulating, acoustical deck or sidewall, they are making economical use of standard structural elements. Tectum deck or sidewall is simple and easy to erect, goes up in a hurry, provides a finished textured surface on the inside and a protective felt membrane on the exposed side. Your metal building dealer knows and recommends Tectum—and Tectum is available in sizes and thicknesses to fit all requirements.

Tectum engineers are available to work with you on the metal building you are considering. Send in your plans today, or get in touch with the Tectum distributor in your area. Complete assistance is yours for the asking.



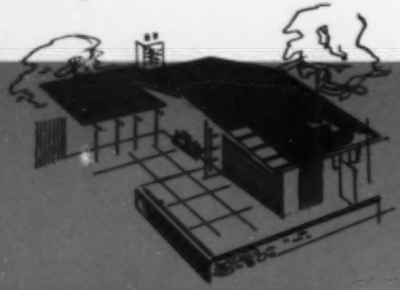


Smart, economical metal buildings such as this are ideally suited for small industrial, commercial, church and many other needs. Tectum acoustical, insulation board transforms the interior into comfortable, beautiful, finished rooms.

NEW USES FOR Tectum

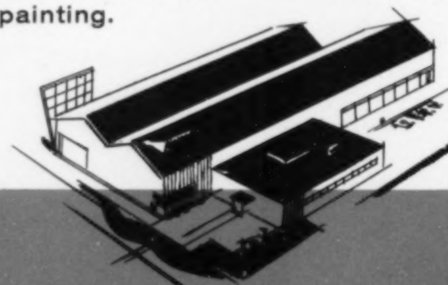
Smart new texture for contemporary homes

Popular, open-beam construction emphasizes the ceiling—makes textured, insulating, acoustical, fire-safe Tectum decks a real buy. Here's why: long strand wood fiber composition makes an attractive surface; the topside is covered with a heavy felt membrane ready for shingles or built-up roofing. Tectum absorbs sound in recreation areas, family rooms. Makes your home look better or sell better, whichever the goal.



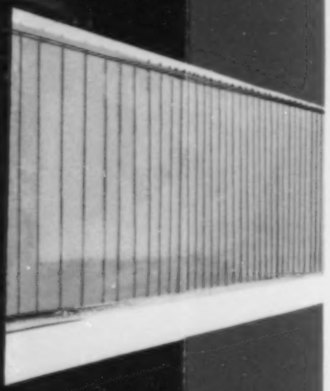
A new approach to suspended acoustical ceilings

Tectum 1" panels offer new appearance, new values for suspended ceilings, costs no more than ordinary tiles, large 2'x4' panels provide an interestingly different appearance. Larger panels erect more quickly, adapt to any suspension system, provide easy access to ducts and utilities above the ceiling. Tough, felt membrane on the topside stops sound transmission and breathing, protects material for a lifetime of service. Noncombustible, tough and durable, will not chip or peel, and normally requires no painting.



ARCHITECTS, ENGINEERS,

HERE'S WHY: Structural, Acoustical, Insulative



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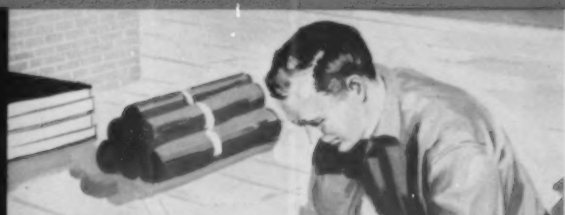
CUTS BUILDING COSTS, SPEEDS ERECTIO

A new bid for tourist business

Busy motels utilize attractive, acoustical Tectum roof decks to lessen sounds from inside and outside . . . a real merchandising feature. Studio-type ceilings are homey and intimate—remove much of the "hotel" atmosphere—makes rooms more liveable. Tectum erects quickly, saves time and labor and eliminates sub-ceilings, plaster, painting and much of the maintenance . . . is tough, durable, noncombustible . . . a new look for motel designers.



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BUILDERS AND CONTRACTORS SPECIFY AND USE...

Noncombustable, Lightweight, Finished Surface, Dimensionally Stable, Resists Fungus

SPEEDS ERECTION, IMPROVES APPEARANCE

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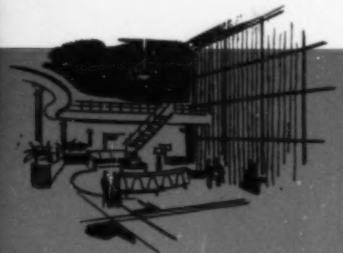
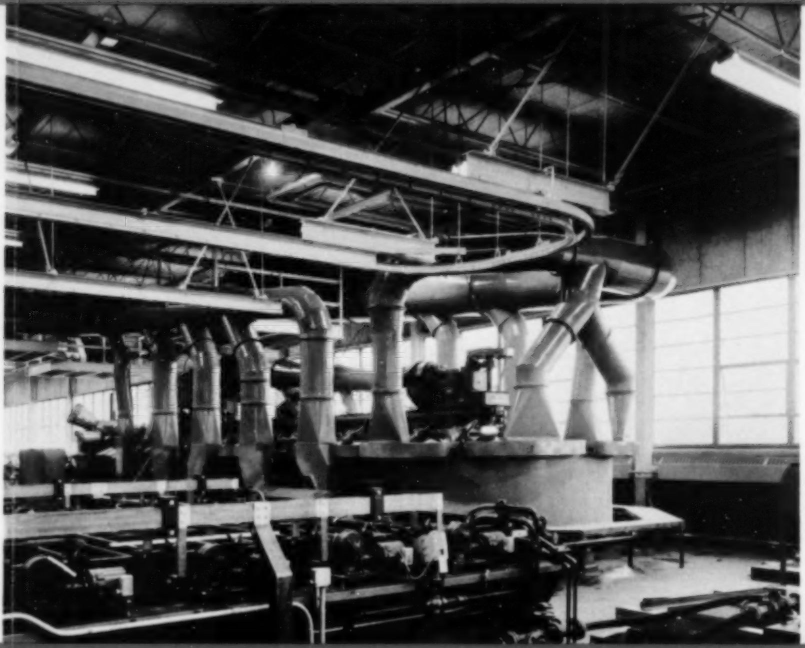
new look for motel designers.



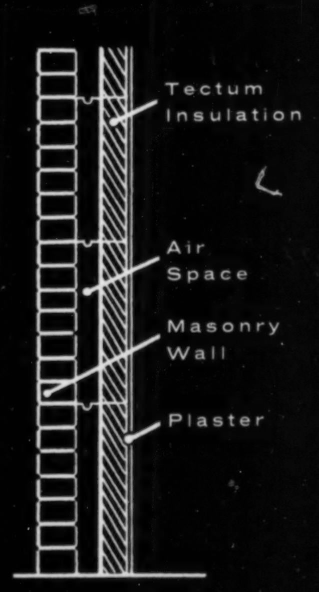


A new concept in industrial sound control

Factory noise and confusion can be reflected—even amplified—by hard floors, walls and ceilings. Tectum decks and sidewalls make sound absorbing areas out of two of these surfaces. Tectum insulates, is structural, resists both sound reflection and transmission—goes down fast, places large areas under roof in fastest time. Normally no painting required, and sidewall panels have attractive paneled effect. Costs comparable with ordinary deck or sidewall.

General purpose board

Tectum, in thicknesses from 1" to 3" is available for all general purpose requirements; gym sidewalls, basement ceilings, remodeling, sheathing, insulation, special acoustical ceilings.



Tectum cavity wall construction

Cavity wall construction consists merely of two walls separated by an air space. In some cases, this may be a masonry exterior with Tectum dry wall construction (tongue and groove panels) on the inside. In others, masonry walls are used in conjunction with walls of Tectum laid up with mortar joints as with other insulating material walls. Plaster may be directly applied. Tectum insulates, is structural, noncombustible and lightweight. Savings in original cost, labor and installation time are important factors.

SPECIFY AND USE... Tectum

mensionally Stable, Resists Fungus

CONTINUING RESEARCH and DEVELOPMENT PRODUCES IMPORTANT NEW APPLICATIONS

While the Research and Development Department at Tectum maintains a consistent program of testing and application research for new uses, the field engineering team continues to grow in manpower and experience for diversified needs. Working as a team with architects and builders, Tectum engineering advancements have met many critical problems for lower costs, greater benefits. Working together—meeting common goals for universal need—has been a Tectum philosophy that not only gets things done quickly but with understanding and success.

Eight District Offices, located strategically across this country and Canada, have become the focal point for a specialized and qualified group of architectural representatives, sales engineers, distributors, and direct factory representatives. Specialized acoustical applicators are eminently qualified to not only plan but erect acoustical suspended ceilings. Sidewall applicators, roof deck specialists, and building supply distributors are the best in the business. Complete engineering assistance is available from the majority of these successful companies and their experience with Tectum is yours for the asking.

TECTUM DISTRICT OFFICES

Eastern District Office
Philadelphia 2, Pennsylvania
2838 Lewis Tower Building
225 South 15th Street
Pennypacker 5-3960—5-3961

Northwestern District Office
Chicago 4, Illinois
601 Railway Exchange Bldg.
Webster 9-5956—9-5957

Southeastern District Office
Atlanta 3, Georgia
313 Candler Building
Jackson 3-3849

Southern Pacific Office
Beverly Hills, California
140 North Robertson Blvd.
Oleander 5-6837

Central District Office
Columbus 15, Ohio
3560 LeVeque-Lincoln Tower
Capital 8-3676

Northern Pacific Office
Seattle 5, Washington
4224 University Way
Melrose 9162

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Canadian Office
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73 Adelaide Street, W
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I'm interested! Please send me complete information on Tectum for the applications checked below:

☐ Roof Deck
☐ Industrial Sidewall Panels
☐ Suspended Acoustical Ceilings
☐ Metal Building Insulation
☐ General Purpose Board

☐ Residential
☐ Motels
☐ Cavity Wall Construction
☐ Other

(Please Indicate Application)

Name ______________________ Title ________

Company ______________________

Address ______________________

City ______________ Zone ____ State ________

Tectum CORPORATION • NEWARK, OHIO

Branch Offices in Philadelphia, Columbus, Atlanta,
Dallas, Chicago, Beverly Hills, Seattle and Toronto, with distributors in all leading area
Factories in Newark, Ohio, and Arkadelphia, Arkansa

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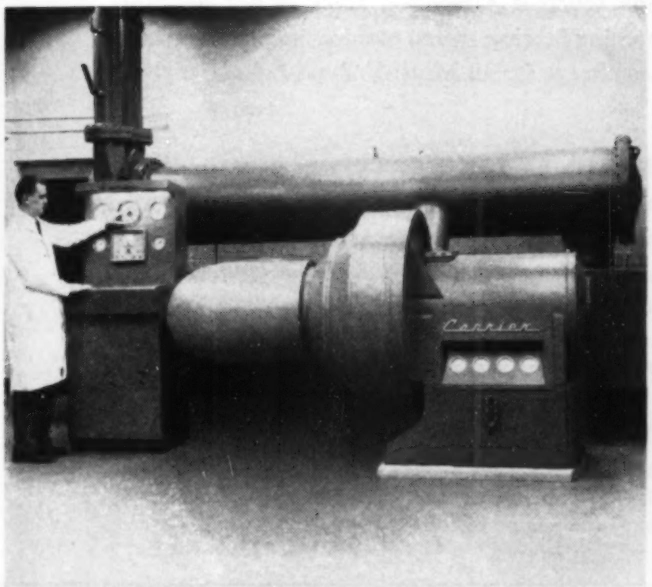
BETTER AIR CONDITIONING FOR EVERYBODY EVERYWHERE

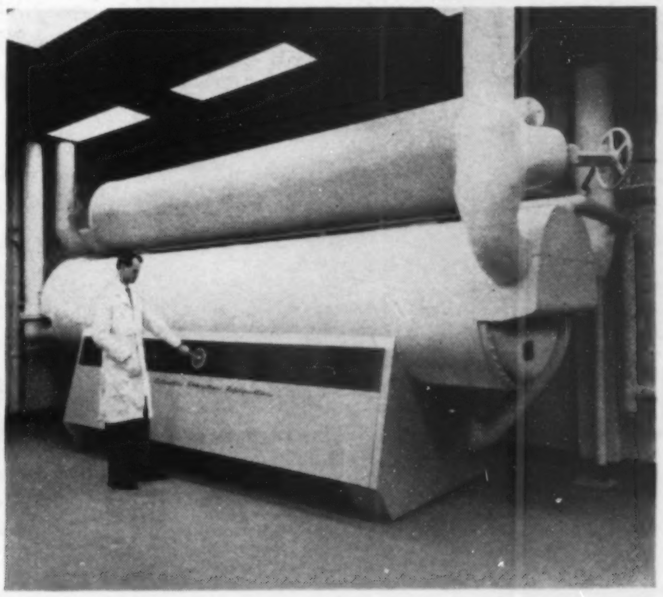
Carrier

Which way is best to air condition a building?

Every building poses different problems. Take the refrigerating machine, for example. Where should it be located? What kind of power is available? How much tonnage do you need? Carrier builds every type of refrigeration for air conditioning. Two of the many types are shown below. Each provides unique advantages under special conditions. Each has been proved practical and dependable in installation after installation. For complete information about them, call your nearest Carrier office. Or write Carrier Corporation, Syracuse, New York.



If you have low-cost electric power, the new Carrier Hermetic Centrifugal Refrigerating Machine offers unmatched advantages. It's the only hermetic with such advanced features as refrigerant-cooled motors through the entire capacity range, hydraulic powered capacity vanes, and electronic controls for completely automatic operation. Its compact design and light weight minimize space and structural requirements. In 28 sizes—90 to 1100 tons. Other Carrier Centrifugals up to 4000 tons. For smaller buildings, there are "packaged" Carrier Reciprocating Water Cooling Machines from 3 to 200 tons.



If you have low-cost steam, the best way may be a new Carrier Absorption Refrigerating Machine. It cools with heat energy derived from low-pressure waste steam or hot liquids to cut costs. Operates automatically at the push of a button. Follows fluctuating loads electronically from full load to zero capacity. It's safe – with water the refrigerant, a simple salt the absorbent. And it's so compact and vibration-free you can locate it wherever there's room to spare – on the roof, in the basement or anywhere in between. In thirteen sizes with cooling capacities ranging from 60 to 700 tons.

Factories in Newark, Ohio, and Arkadelphia, Arkans

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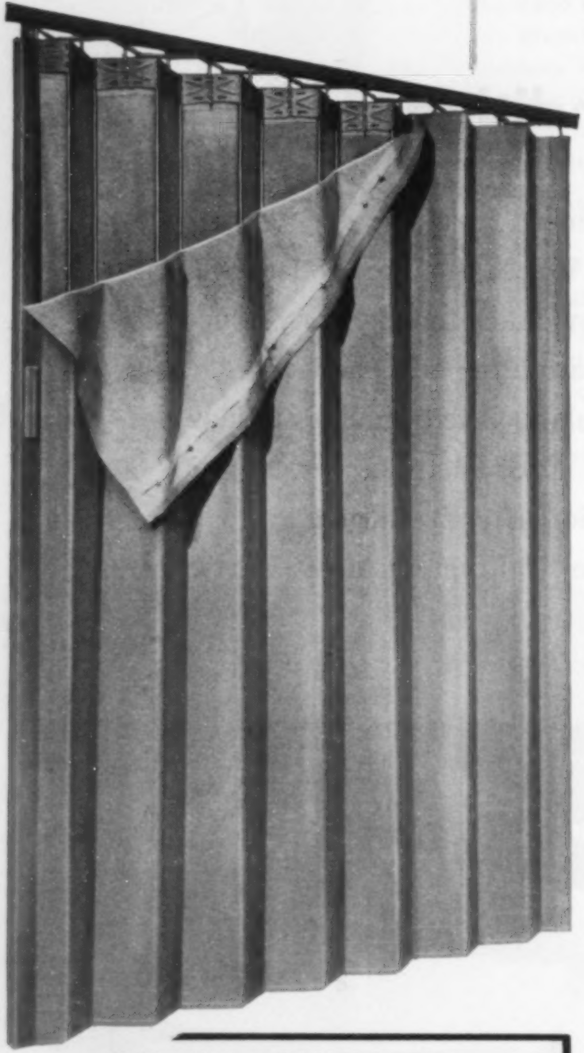
Pick the type that's *right* for you—

Fabric-covered folding doors are modern, exciting, beautiful! And they're economical, too. They save space, they cut down installation costs and they're easy to maintain. Whether for giant room dividers or inconspicuous closet doors, they're the perfect way to increase usable floor space.

These basic advantages of all folding doors tend to be-



Multi-V Foldoor

DO YOU WANT–

NARROW PROFILE—A desirable feature on many installations, particularly for smaller openings and thin-wall construction. This slim contour is inherent in the design of the Multi-V Type FOLDOOR.

CONCEALED TRACK—often is a critical factor in low ceiling installations or for existing wood-trim doorways. The track never shows on Multi-V Type FOLDOOR installations.

DECORATOR CORNICE—provides a dressy, finishing touch if a recessed track is not desirable. Matching fabric-covered cornices are supplied at no extra charge for all Multi-V Type FOLDOORS.

MINIMUM STACK SPACE—can be an important consideration, both on extremely narrow doorways and for exceptionally wide room dividers. The Multi-V Type FOLDOOR offers the smallest stack space of any folding door on the market.

Then you want Multi-V Foldoor

Exclusive with Holcomb & Hoke, proved in use by thousands of satisfied customers. For more information check "Multi-V" on the handy coupon, on the opposite page.

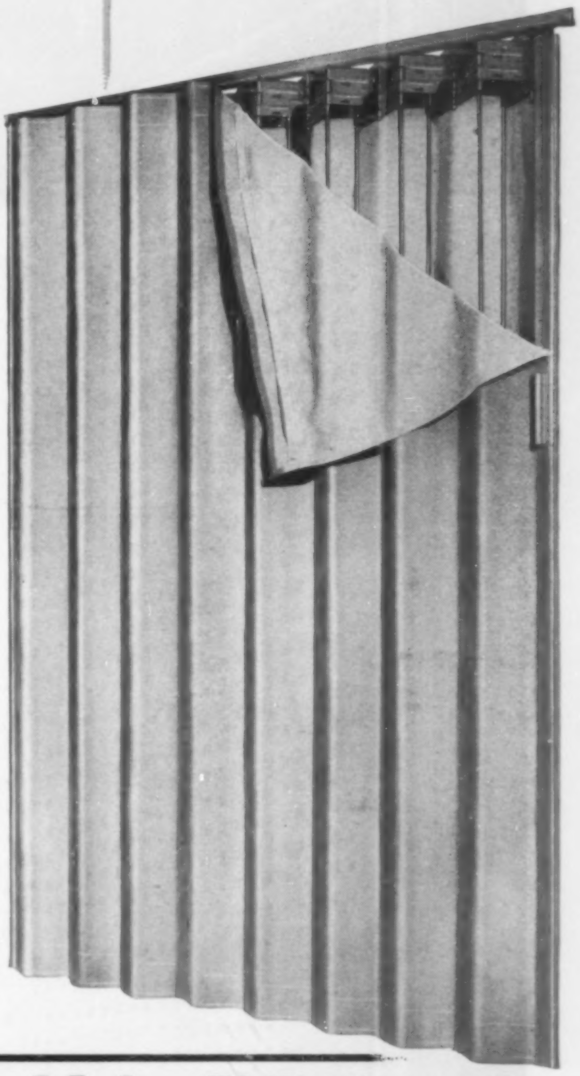
HOLCOMB & HOKE
FOLDOOR
FOLDING PARTITIONS AND DOORS ®

THE ONLY COMPLETE OF FABRIC-COVERED

HOLCOMB & HOKE MANUFACTURING CO., INC.
1545 VAN BUREN STREET, INDIANAPOLIS, INDIANA

you an unbiased choice
Foldoor makes both at same price

come obscured in the competitive discussions of the relative merits of different manufacturers' designs. *But not when it's a* FOLDOOR. Holcomb & Hoke is *the only manufacturer offering a complete line* in both the two principal design types. So we say, "pick the type that's right for you"—There's a FOLDOOR to fit every need and size.



DO YOU WANT—

BROAD PROFILE—frequently is desirable, to provide a more substantial look on extremely high-ceiling installations or for thick-walled doorways. This broader profile is inherent in the design of the Multi-X Type FOLDOOR.

COMPACT RECESSED TRACK—reduces installation expense and space requirements on those applications where an exposed track or cornice would not be desirable. The Multi-X Type FOLDOOR requires a smaller recess space than the Multi-V Type.

FLUSH MOUNTING WITHOUT CORNICE—presents a pleasing appearance on broad expanses of existing ceiling. The construction of the Multi-X Type FOLDOOR permits such flush mounting without a cornice.

MAXIMUM RIGIDITY—becomes a consideration for large folding doors, especially in schools, churches and other institutions where hard usage is expected. The design of the Multi-X Type FOLDOOR incorporates extra frame rigidity.

Then you want Multi-X Foldoor

Multi-X Foldoor

The latest edition to the FOLDOOR line, permitting us to offer you unbiased assistance in selecting the *right* door for your needs. For more information check "Multi-X" on the handy coupon below.

LINE

FOLDING DOORS

IN CANADA: FOLDOOR OF CANADA
MONTREAL 26, QUEBEC

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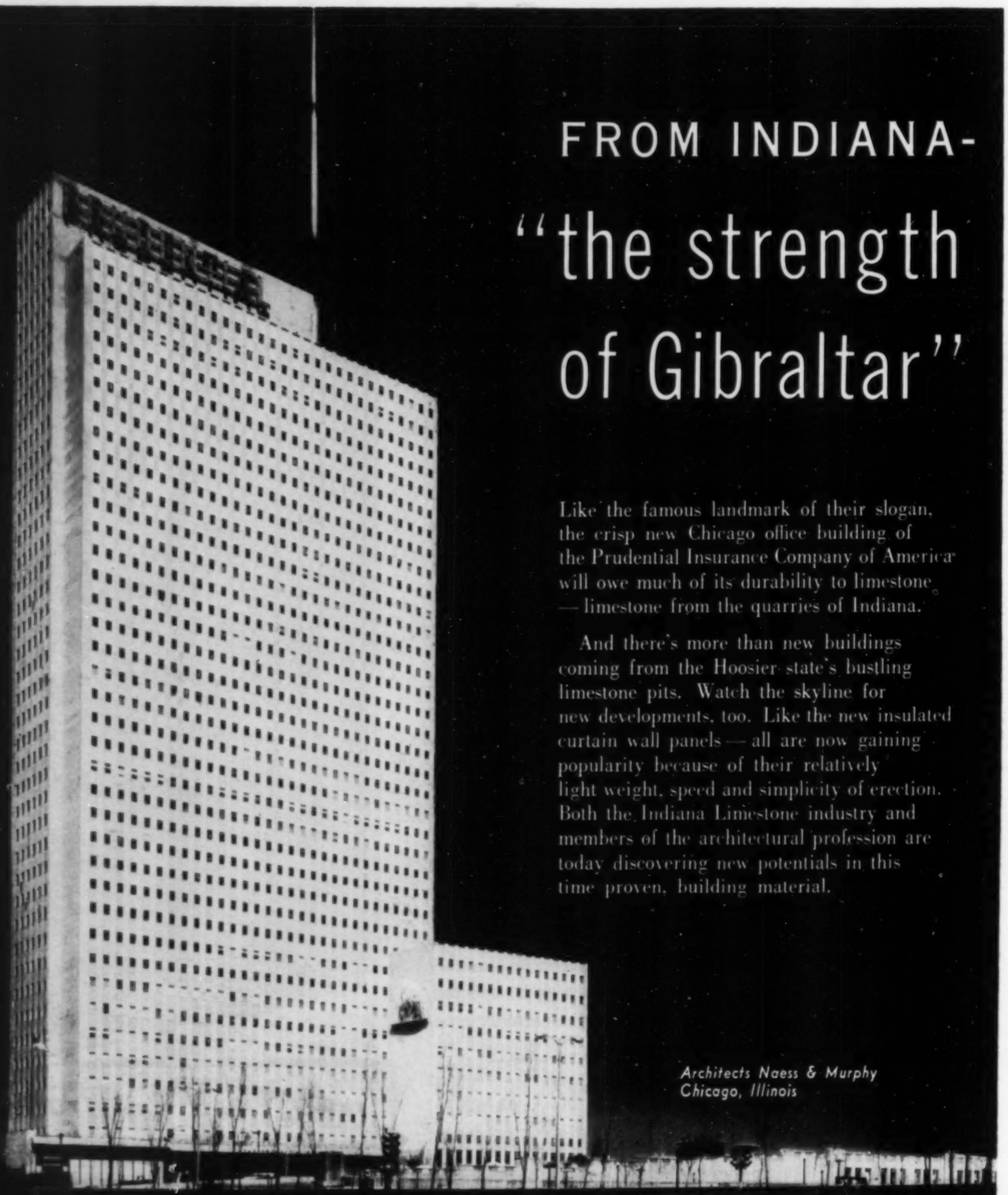
Indianapolis, Indiana

Yes—please send me more information on
☐ Multi-V Type Foldoors
☐ Multi-X Type Foldoors

Name .... Title ....
Company ....
Street Address ....
City .... Zone .... State ....


FROM INDIANA-

"the strength of Gibraltar"

Like the famous landmark of their slogan, the crisp new Chicago office building of the Prudential Insurance Company of America will owe much of its durability to limestone — limestone from the quarries of Indiana.

And there's more than new buildings coming from the Hoosier state's bustling limestone pits. Watch the skyline for new developments, too. Like the new insulated curtain wall panels — all are now gaining popularity because of their relatively light weight, speed and simplicity of erection. Both the Indiana Limestone industry and members of the architectural profession are today discovering new potentials in this time proven, building material.

Architects Naess & Murphy
Chicago, Illinois

INDIANA LIMESTONE INSTITUTE

Full specifications on all Indiana Limestone products available.

INDIANA LIMESTONE INSTITUTE

Founded 1932 as a service organization for the architect and contractor.

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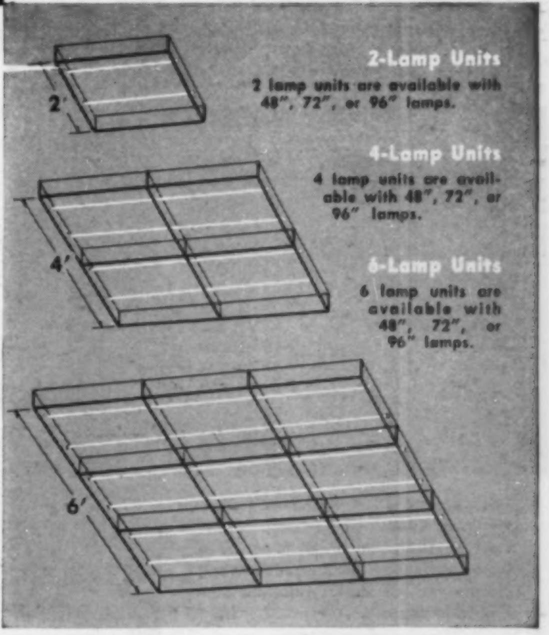
A "Floating Panel" Luminaire

Panelaire

the newest *"pacesetter"* innovation in large area illumination

Provides an even distribution of high level light on the ceiling and "washes" the walls with glare-less illumination free of annoying contrasts.

Panelaire is ideal for offices, classrooms, drafting rooms, display and other areas where high levels of illumination are desirable. It is factory pre-assembled as a single unit, delivered complete in a single carton ready to install. Polystyrene louver diffusers with 45° shielding permit 200 foot-candles of comfortable illumination, easily inter-changeable vinyl pan diffusers allow 100 foot-candle intensities. For complete Brochure send coupon below today.



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2 lamp units are available with 48", 72", or 96" lamps.

4-Lamp Units
4 lamp units are available with 48", 72", or 96" lamps.

6-Lamp Units
6 lamp units are available with 48", 72", or 96" lamps.

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HIGHLAND PARK, ILLINOIS
Dept. 2-A
the "pacesetter" in the lighting industry

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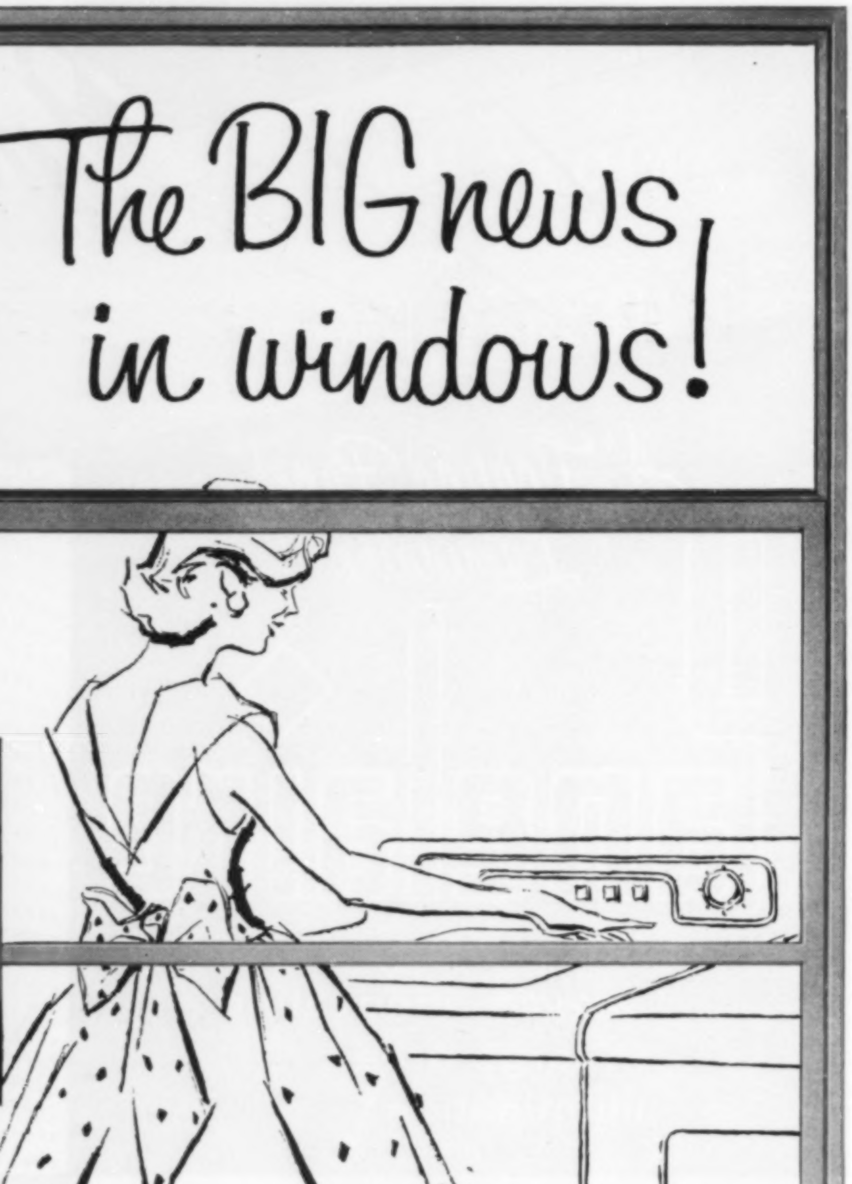
The BIG news in windows!

APPLIANCE-SMOOTH! Smooth, hard and glossy as your automatic washer is the surface of Truscon Steel Windows with exclusive new Supercoat Process. This finish actually was developed for appliances.

INSTALL WITHOUT PAINTING! Steel windows finished with Truscon Supercoat Process need no painting when installed. Maintenance painting won't be needed for many years. Exhaustive tests prove it.

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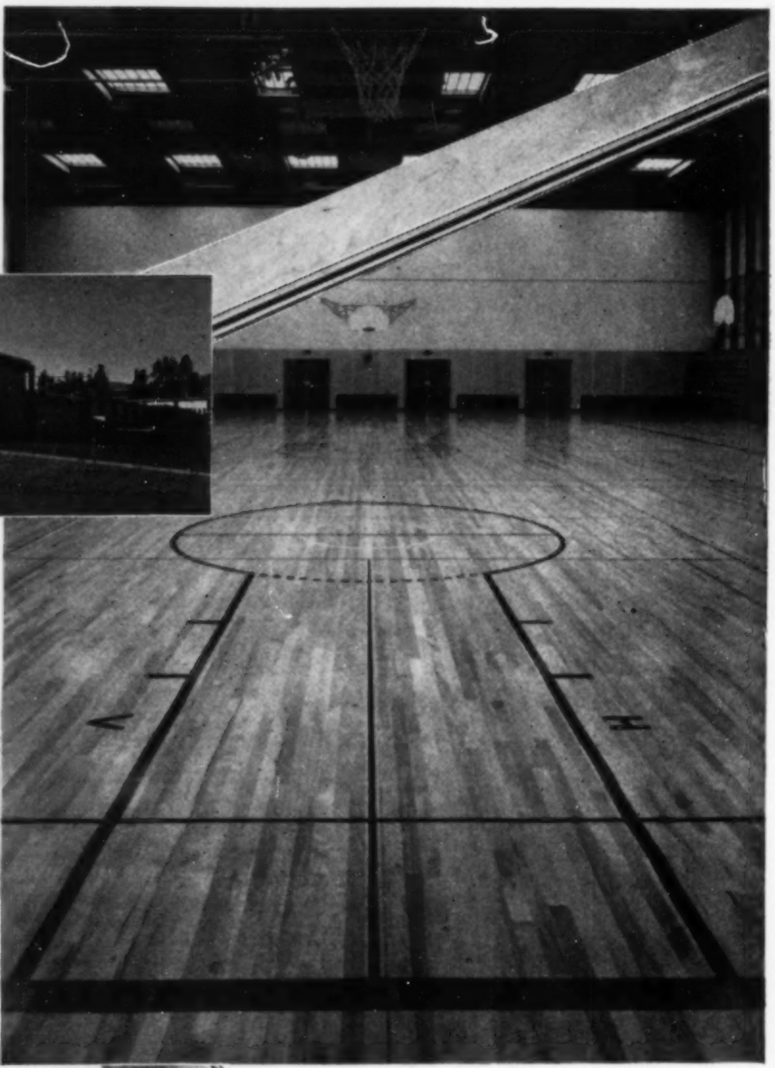

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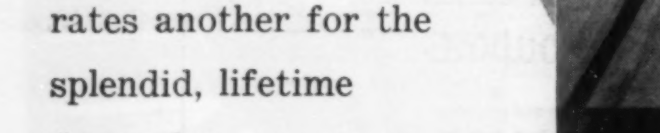

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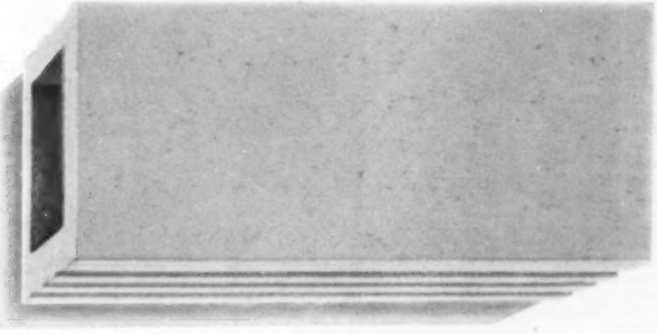

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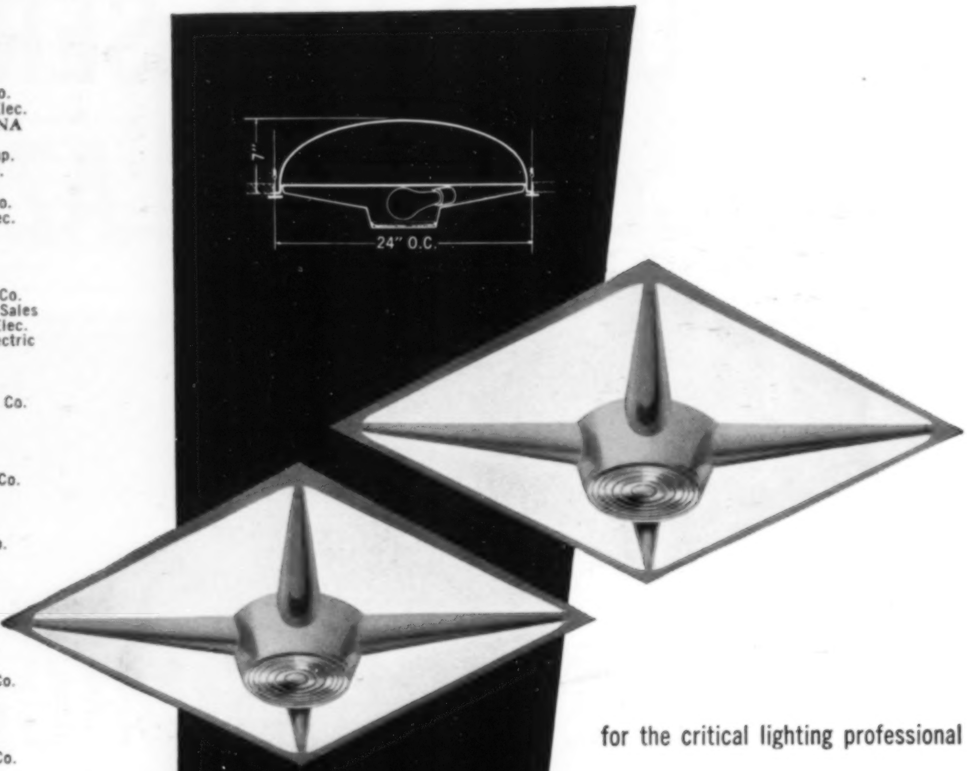

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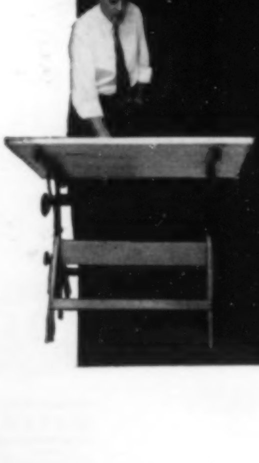

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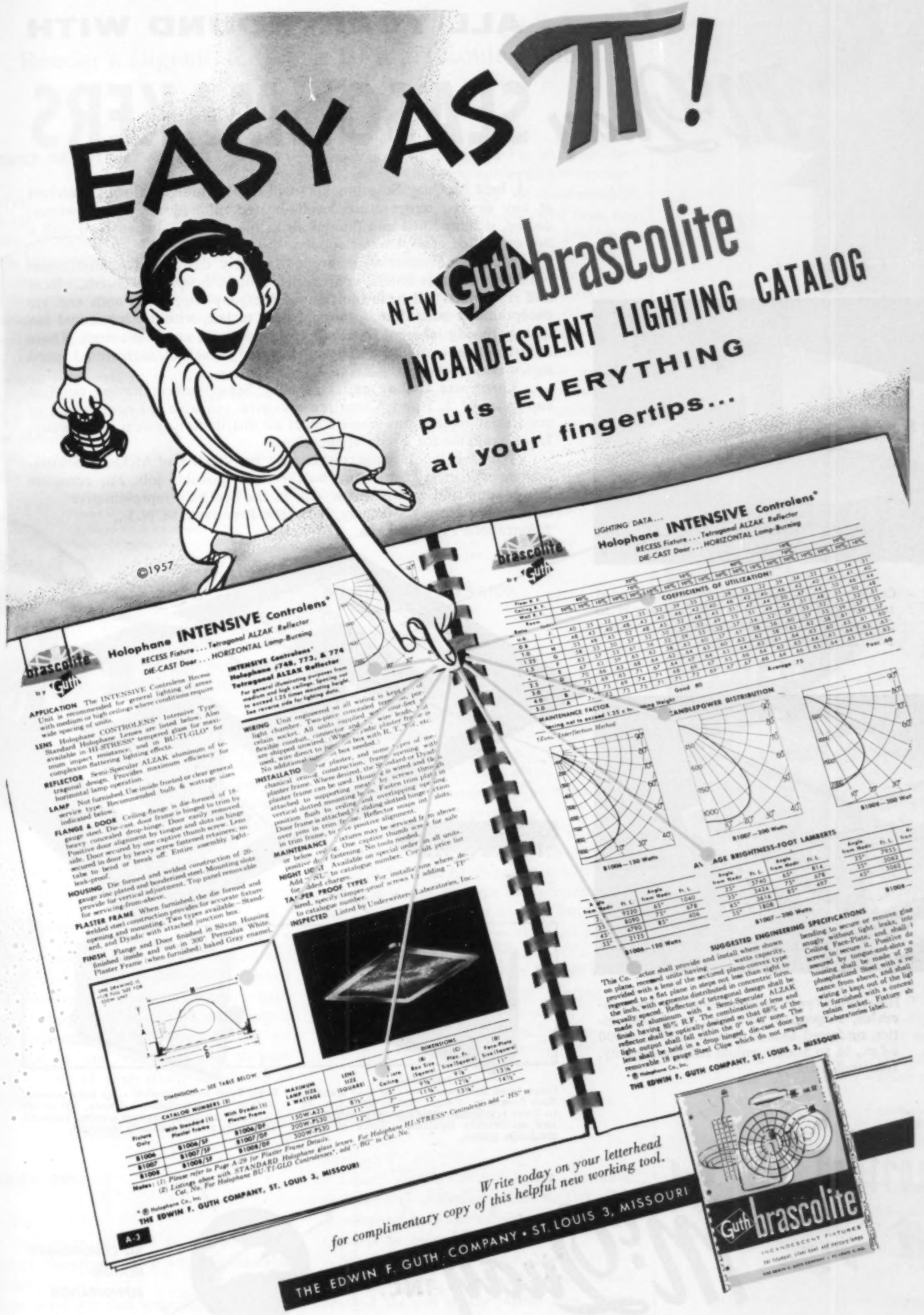EASY AS π!
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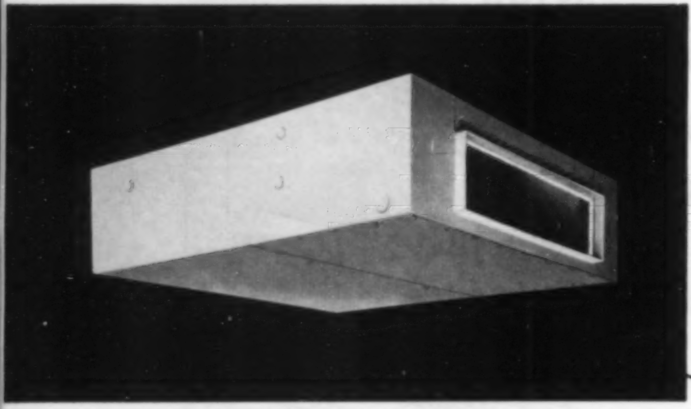

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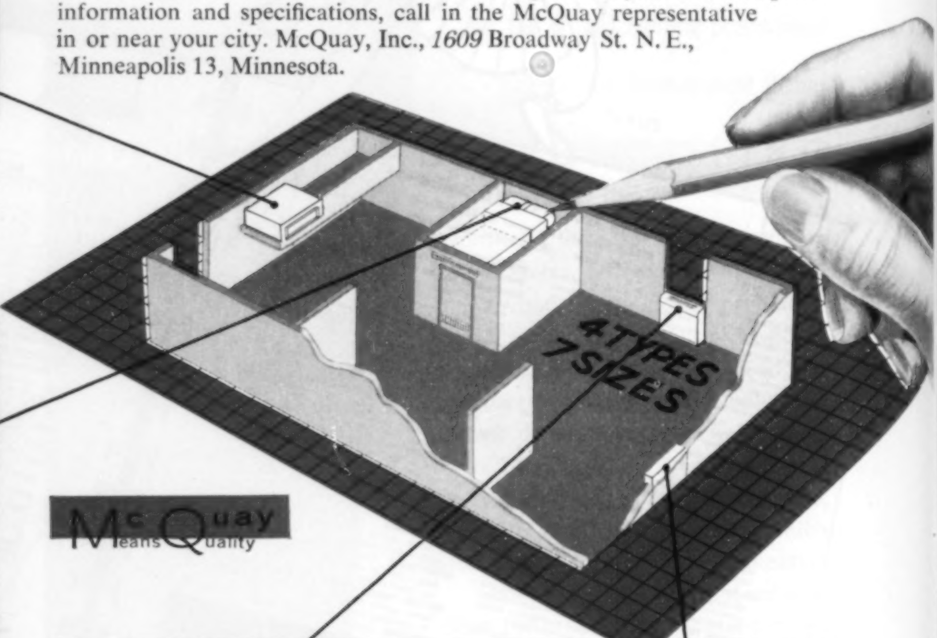

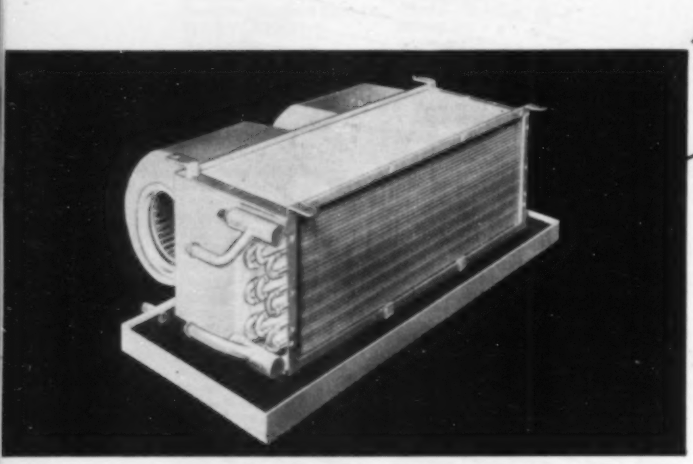

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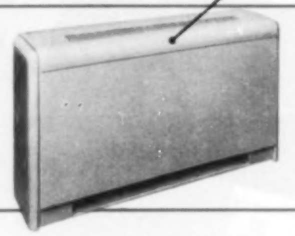

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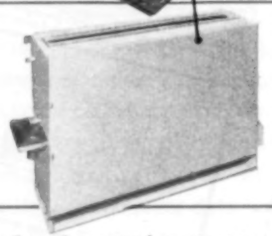

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Letters

. . . Reader's Digest . . . Urban DP's . . . Louis Kahn

DIGEST REBUTTAL

Forum:

Your answer to the *Readers' Digest* article (FORUM, Nov. '57) is a great assist to the thousands of public-spirited citizens who are devoting tremendous time, study, and energy as members of unpaid boards of education to planning the necessary new educational facilities to meet today's needs.

It is also of invaluable benefit to all American taxpayers in helping them evaluate proposed building programs honestly rather than be influenced by hysteria and false plausibility.

You have performed an outstanding public service.

FREDERIC P. WIEDERSUM
Frederic P. Wiedersum Associates, architects & engineers
Valley Stream, N.Y.

Forum:

Here are excerpts from a letter I have sent to *Reader's Digest*:

". . . The article in the ARCHITECTURAL FORUM for November expresses my opinion of Mr. Harvey's article without further comment.

"I would be interested in a rebuttal, if such is possible, by Author Harvey or his *Digest* editor, on the comments by the ARCHITECTURAL FORUM. I strongly suspect that such a rebuttal will not be forthcoming . . ."

O. KLINE FULMER
Fulmer & Bowers, architects
Princeton, N.J.

Forum:

We are in the process of designing a million dollar consolidated high school and members of the school board have asked us to answer the *Reader's Digest* article. Clearly, you have answered this article more thoroughly and eloquently than we can hope to, and we would like to pass along a copy of your article to our school board.

HOWARD D. BANGLE, *architect*
Salisbury, N.C.

URBAN DP's

Forum:

I read your editorial in the November issue on America's DP's with considerable interest.

You point out that urban renewal is the biggest uprooter of families. It is a major cause, of course, but compare it with the urban highway program. For example, between 1948 and 1956 nearly 24,000 families were relocated in Chicago. Of these roughly 4,600 (19 per cent) were relocated from redevelopment areas and 6,000 (25 per cent) from expressway sites. The federal highway program has no provision for relocation. It is not required by federal regulations nor are expenditures for relocation included as part of highway costs.

It would be worth-while for someone to determine just how well families are being relocated under the redevelopment program. Because of some early unfortunate experiences, the general impression of poor operations has been prevalent. I think you will find, however, that the record is quite good.

WILLIAM L. SLAYTON, *vice president*
Planning and redevelopment
Webb & Knapp National Corp.
Washington, D.C.

DUBIOUS PROFESSION

Forum:

I read the Perkins & Will story with great interest (FORUM, Oct. '57). I thoroughly agree with it—as far as it goes. But I do not think it is frank enough.

The practice of architecture today is not quite the 100% "profession" that it continues to claim to be. It is about 50% "profession" in character and at least 50% "business"—in my opinion.

One of the determining factors in calling an effort of any kind a "profession" seems to me to be that of giving service without cost if it is necessary for the individual's or the public's need. The medical profession truly does this and so does the legal profession. Between you and me, I can't recall seeing this attitude sincerely carried out in the architectural "profession" during the course of my 20 years in business.

PHILLIP J. DANIEL
Daniel, Mann, Johnson & Mendenhall, architects and engineers
Los Angeles, Calif.

KAHN'S BRILLIANCE

Forum:

Louis Kahn's brilliance in handling architectural concrete (FORUM, Oct. '57) is comparable to the achievements of Felix Candela in Mexico.

Steel architecture under Mies van der Rohe's refining influence has just about reached the end of the street. Now, under the inspiration of designers in concrete like

continued on p. 64

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See Sweets 17 a/FEN

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Louis Kahn and Mexico's Felix Candela, a whole new field is opened. Their work should be a great inspiration to all designers.

GARDNER A. DAILEY, *architect*
San Francisco, Calif.

Forum:

I enjoy Kahn's freedom in expressing his structural and formal concepts, his willingness to treat these elements in terms of visual effect rather than in terms of function only.

At the same time, I would hope that there would be no concerted effort to establish a Kahn school of architectural thinking. There are too many schools at the present time, each professing to have the true answer to contemporary design.

ARCHIBALD C. ROGERS
Rogers, Taliaferro & Lamb, architects
Baltimore, Md.

PRECIOUS YOUTH

Forum:

In "Obligation for 1957" (FORUM, Nov. '57) you correctly muse that American youth may be maturing more rapidly than the youth of the past. But you credit them with too much precocity when you say that "In the mid-1960's, the elementary schools will get their second shock wave, as the postwar babies begin sending *their* babies."

I trust that the computation (which marries off these youngsters in high school), rather than FORUM's logic, is wrong.

LEO MILLER
New York, N.Y.

▪ *The computation was off by about six years. The 1940-45 crop of youngsters will have become involved in parenthood by 1965, but not in P.T.A. work.*—ED.

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Bost Building Equipment Co., Charlotte
OHIO
Acoustical Contracting & Supply Corp., Cleveland and Youngstown
Cincinnati Floor Company, Cincinnati
Riethmiller Acoustic Company, Columbus
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Denman Floors Company, Oklahoma City
Harold C. Parker & Company, Oklahoma City
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OREGON
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PENNSYLVANIA
Acousti-craft, Inc., Philadelphia
Standard Floor Company, Pittsburgh
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TEXAS
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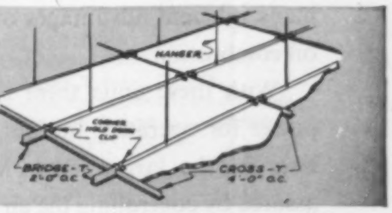
FORESTONE CEILING BOARD INSTALLATION



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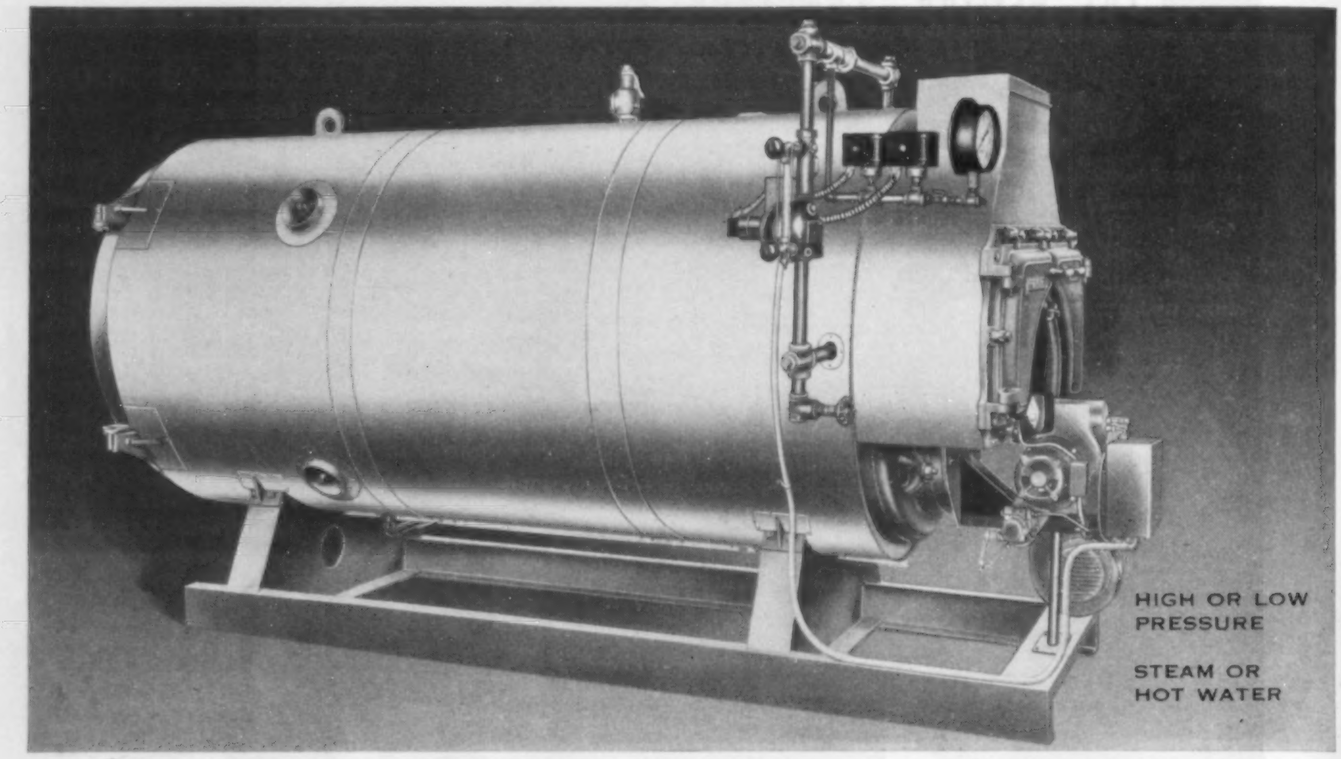

Kewanee low pressure boiler with Iron Fireman MicroMist forced draft burner for heavy oil.

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KEWANEE
BOILERS

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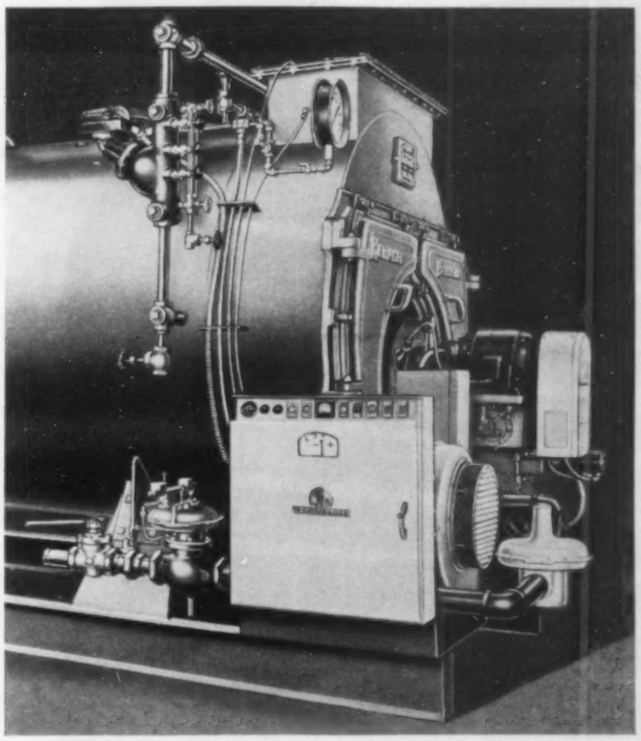

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Contest shaping up for 1958 national AIA presidency; group named to study Panama Canal enlargement plans

In the closing weeks of 1957, various AIA members generated a broad smattering of news in several fields of endeavor and opinion:

As nominating petitions from members throughout the country continued to come in, it became apparent there might be a struggle for the AIA presidency at the national convention in Cleveland next July. The contest, if it materializes, will be the first since the 1954 election, and very likely will be between two Ohioans. Since announcement of the nomination of Clevelander **Alexander C. Robinson** III (FORUM, Nov. '57), AIA headquarters also has received sufficient petitions nominating **John N. Richards** of Toledo, first vice president last year and this. Richards, 53, was Great Lakes district AIA director from 1949 through 1953, and formerly president of AIA Great Lakes Regional Council. One nomination already has been made for 2nd vice president: **Herbert C. Millkey** of Atlanta, who would succeed **Philip Will** Jr., of Chicago.

LIFE: HOWARD SOCHUREK

FULLER

At Clearwater, the Florida Association of Architects held its annual convention, and, after it was all over, everyone agreed a lot of ground—space—had been covered. Space, in fact, was the leading topic at Clearwater. **R. Buckminster Fuller**, 62-year-old geodesic domemaster, brightened the proceedings by taking potshots at everything from Florida houses to modern sewage systems. (Of the former, Fuller said: "I don't know if I'm looking at a furniture store or a house"; the latter he called "a 3,000-year-old type.")

Fuller, like most other people, was infected by the nationwide preoccupation with outer space and how to get there. He decreed that city design based on walking is obsolete, and called for concepts that take into account the probability that "in ten years the earth will be one town."

Somehow, amid the space talk, the Florida architects got around to making some awards and electing new officers. **Victor Lundy** (FORUM, June '57) won the honor award for his Bee Ridge Presbyterian Church in Sarasota. **H. Samuel Kruse** is the new president.

THE ASSOCIATED GENER
OF AMERIC

ROONEY

Coincident with the Florida convention came the announcement of formal organization of the Florida Foundation for the Advancement of Building. Organization meetings attended by architects, builders, and realtors were held last summer, but now the structure of the Foundation is set and **Frank J. Rooney**, Miami builder and former president of the Associated General Contractors has been named as its first president. **Dr. Turpin C. Bannister**, dean of the College of Architecture and Fine Arts of the University of Florida, said: "The Foundation will organize the considerable resources of the building industry in Florida to investigate the problems of designing and erecting buildings under the special conditions prevailing in Florida." The university will collaborate closely with the Foundation in research and in publishing reports.

In New York, the AIA chapter's publications committee headed by **Gillet Lefferts** Jr. sought material that would alter its periodic *Oculus* from one that has been "performing its function adequately" into one that would be "a vehicle for better acquaintance and familiarity among its readers . . . and brighten all our lives." With this design in mind it made an appeal to members to send in items "of personal gossip type, about themselves or other members, which is printable within the limits of laws of libel and/or defamation of character." Built-in protection was offered against "embarrassment or lawsuits": before publication any item "will be carefully screened for veracity and will require express permission of any and all persons mentioned or referred to therein."

On a loftier plane, the chapter's public relations committee headed by **Robert Jacobs** was completing a successful campaign to raise $20,000 to put the chapter's best foot forward to the general public. In two months 112 firms and individual members contributed about 70% of the goal. One project the committee may finance with part of its new wealth: formation of an advisory service for architects who feel their work is worthy of publication in the press, but who do not know how to go about getting it accepted.

TVA ON THE MEKONG

The Mekong River meanders for 2,600 miles from the mountains of Tibet, through the jungle-gorged heart of the peninsula once known as Indochina, and

continued on p. 71

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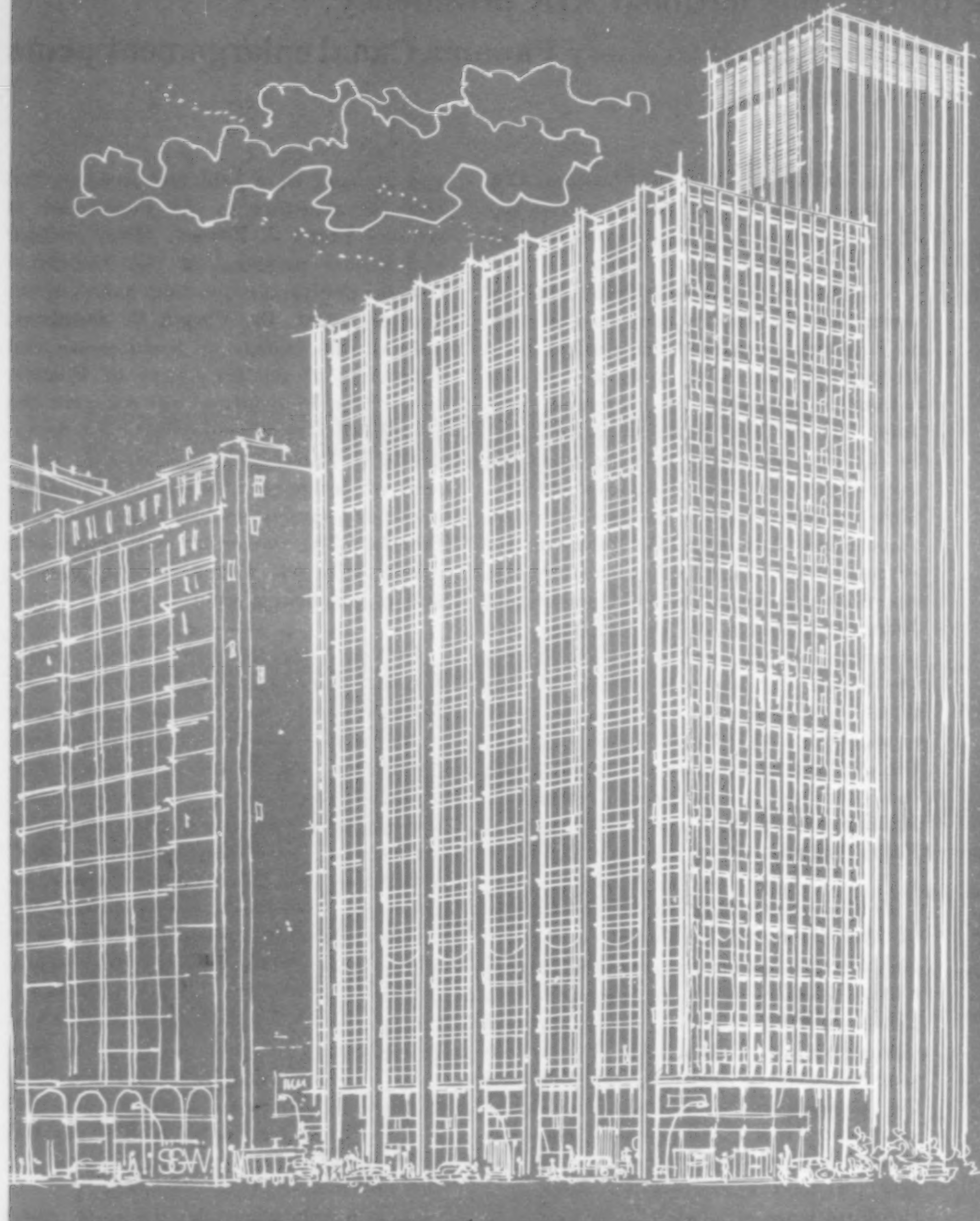

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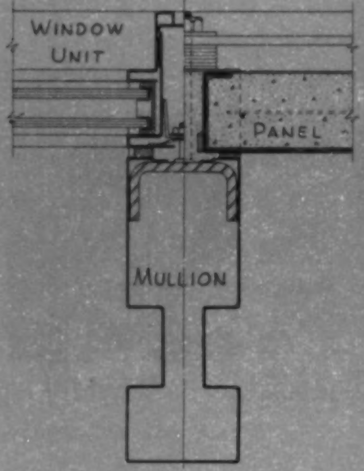

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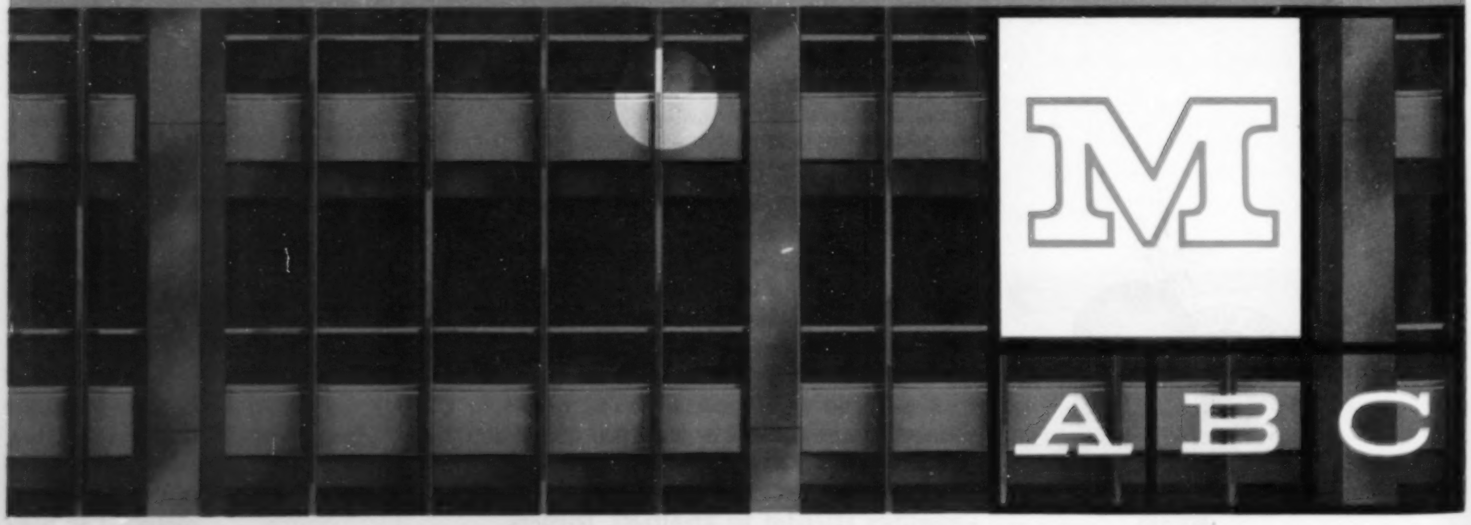


empties into the Gulf of Siam. Like most Asian rivers, it is still master of those who inhabit its banks—its floods cover millions of acres of land every year.

Now, a mission sponsored by the United Nations and led by Lieutenant General **Raymond A. Wheeler** is in Bangkok studying ways to harness the Mekong. Present plans call for multipurpose river development, similar to the TVA development. At least three dams are projected, to provide irrigation, hydroelectric power and to make the river navigable. The project will involve the cooperation of Thailand, Cambodia, Laos and Vietnam, whose 17 million people would gain an estimated 9 million acres of irrigated, arable land.

NEW JOBS

A special technical staff to advise the House Merchant Marine Committee on the possible enlarging of the Panama Canal has been appointed. The six are: Lieutenant General **Leslie R. Groves** of Sperry Rand who headed the Manhattan Project which developed the A-bomb; **Francis de S. Friel**, vice president of the American Society of Civil Engineers; Dr. **S. C. Hollister**, dean of engineering at Cornell University; **E. Sydney Randolph**, industrial engineer who has worked in the Canal Zone for over 30 years; **Hartley Rowe**, vice president of United Fruit Co.; and **John E. Slater**, engineer and former president of American Export Lines. House committee chairman, Rep. **Herbert C. Bonner** (D., N.C.) said the special staff was appointed because the canal is "approaching obsolescence."

Captain **Eugene J. Peltier** is the new Chief of the Bureau of Yards and Docks (BuDocks in Naval parlance) and thereby becomes a rear admiral. Peltier vaulted over six admirals and 33 other captains who stood senior to him for the job. Peltier served with the Kansas State Highway Commission before World War II, and with the Seabees during the war. He was district public works officer at Pearl Harbor, later was BuDocks' assistant chief of maintenance and material.

KUMP'S SCHLOSS MATZEN

Many U.S. architects probably would like to own a castle in the Tyrol, "2,000 feet above sea level where," according to the real estate brochure, "the air is crisp as dry wine." One who does is San Francisco's **Ernest J. Kump** who has bought a famous, 35-room castle, the tower of which dates back 1,500 years. Kump's castle is called Schloss Matzen, and it is near Brixlegg on the road between Innsbruck and Salzburg, Austria. Architecturally, it caught his eye on previous European visits. When he heard it was up for sale, he jumped at the chance and bought it through Previews Inc. for about $75,000. Kump, who has a number of European projects underway, including a multimillion dollar housing project in Spain, plans to live in the house during the summer.

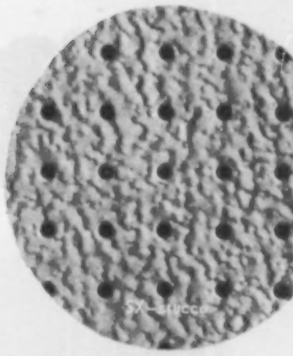
DEATH TAKES TWO SCULPTORS

Mahonri Mackintosh Young, 80, famous sculptor and grandson of Mormon leader Brigham Young, died Nov. 2 in Norwalk Conn. Young's Mormon background was the inspiration for some of his best-known work: the famed sea gull memorial in Salt Lake City, his statue of Brigham Young in the Statuary Hall of the Capitol in Washington D. C., and the giant sculpture at Emigration Canyon near Salt Lake City, commemorating the movement of the Mormons west and the founding of the city. Young was a bright flame of leadership and experimentation in the twenties and thirties and gained renown not only as an artist but as a teacher. He moved restlessly among all art forms, sketching, painting in oils and water color, but his finest work was done in bronze.

Another well-known sculptor, **Ulric H. Ellerhusen**, died Nov. 9 at the age of 78 in Towaco N.J. Ellerhusen is famous for his series of statues called the "History of Religion" at the University of Chicago, and his statues and decoration at the Church of the Heavenly Rest in New York City. He also designed the Schwab Memorial Fountain at Yale, and the statue of the Oregon pioneer atop the State Capitol at Salem Ore. He won the 1929 Gold Medal of Honor for Sculptors of the Architectural League of New York.

OTHER DEATHS: Internationally famous Mexican Muralist **Diego Rivera**, 71, center of many controversies because of his Communist beliefs (the most noted incident was the obliteration of his uncompleted mural for the main building of Rockefeller Center, in which he started to depict Lenin as the key figure in an enormous tableau that was to show the emancipation of mankind through technology) Nov. 25, in Mexico City; **James M. Bradford**, 54, former president of the National Association of Building Owners and Managers (1952-54), Oct. 25, in Seattle; Landscape Architect **Arthur Shurcliff**, 87, who recreated the gardens and grounds at Williamsburg Va. and Old Sturbridge Village Mass. and laid out town plans for 37 U.S. towns and cities, Nov. 12, in Boston.

The First . . .



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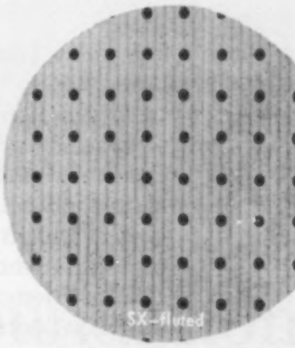

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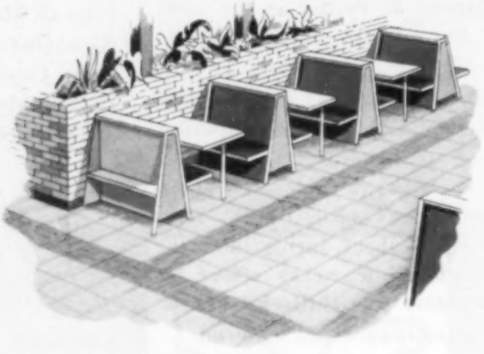

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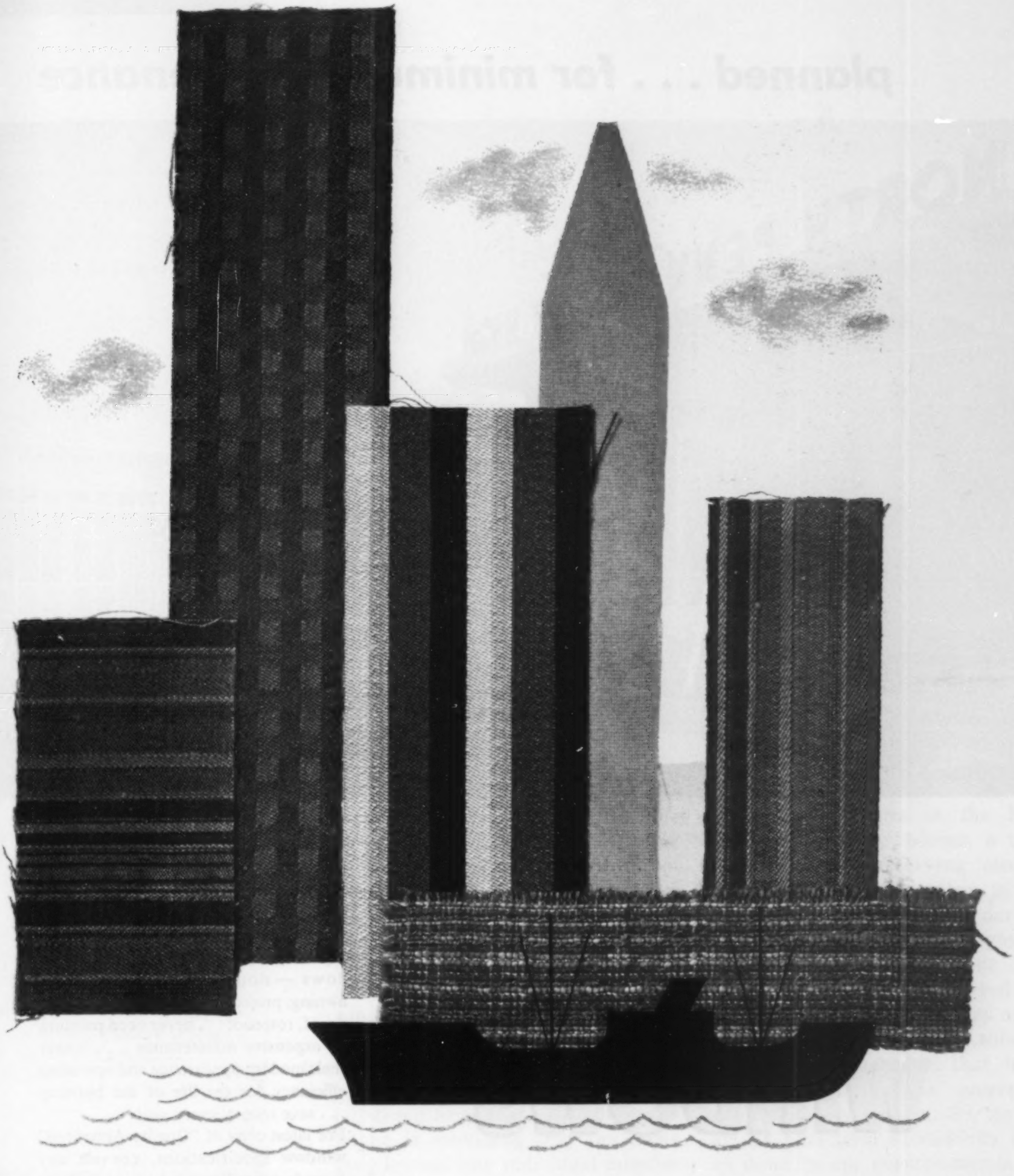

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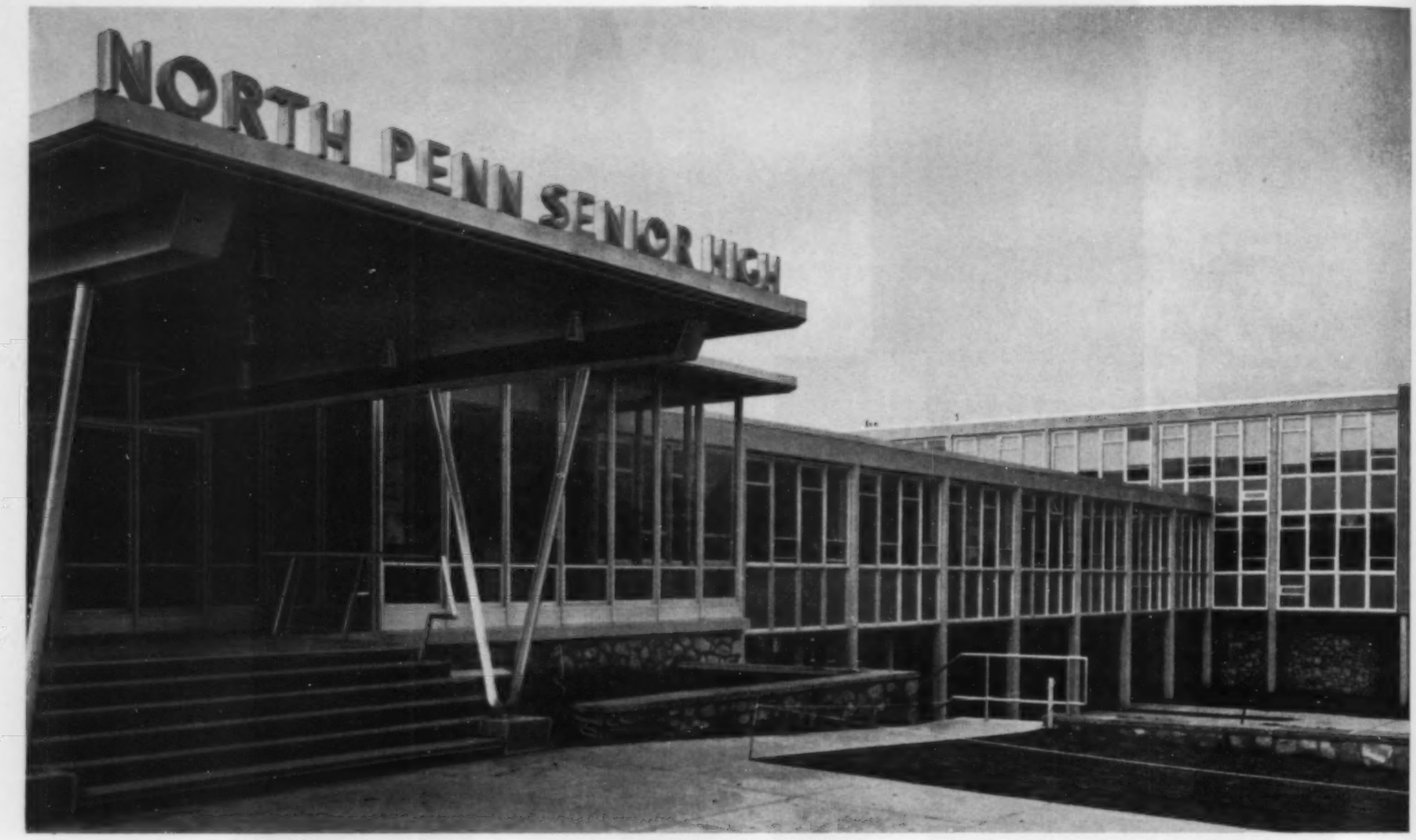

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Editorial

Art and Science: the crisis

A good deal is being heard these days about the role of science in society, largely from the same scientific voices that for well over a decade have been trying to warn the American people of their peril. Wisdom has been heard, but, like most wisdom, it must first become a bitter part of flesh and blood before it is heeded. Since nothing of the human or social crisis is alien to architecture, and architecture must play a role in the struggle ahead, it may be well at the beginning of this year to think about a transcendental crisis that will be with us for a long time.

That there is a crisis in science is beyond argument. Moreover, the public is convinced that the crisis goes beyond any individual missiles program into the question of education and science, and attitudes toward science as such.

That the emergency might extend still further, into the realm of art, and that an art crisis might be serious, too, is a statement that many might laugh at. Is this not stretching a scheme too far? Is not art trying for a ride on sputnik? Alas, no. For the artist, too, is a seer of a kind that is closely allied with the scientist, and the myopia which regards him as only a prettifier is the same kind of myopia which regards the scientist as a somewhat dangerous eccentric, useful only under close control.

For most of this century, both science and art have been playing an increasingly uneasy, explosive role in Western civilization with heavy repercussions in the East. Science will never become a truly beneficent, life-preserving element in society until it is taken in and made a meaningful part of our culture, not a thing apart—neglected, cuffed, and persecuted one day, fawned upon and overplayed the next. It is usually treated as a servant, and the scientist is subordinated to the manager, that indispensable but perhaps overvalued member of our society. So, too, the artists have been successfully beaten down in our overcommercialized civilization to a subordinate role. The seer in art and the seer in science must now have equal voice with the best managerial talents in our industrial society, or this civilization faces self-destruction. That is the nature of the crisis.

For their part, the arts and sciences must learn, looking beyond their specializations, differences and divisions, that they are truly and historically allies in this struggle, born of the same mother, complementing one another—the one having for its province all immeasurables, the other the measurable—

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and that only together can they make this civilization endurable as well as enduring. This is nowhere seen more clearly than in architecture, where art and science meet, uneasily still, not without some shock and strain and unassimilated mechanical details, but more and more coming together in new forms and exciting portents. In architecture and building there is some evidence, small as yet, that we are learning.

Science in architecture

On one side, there is growing realization of the dynamic role to be played by science, research, and engineering in architectural development. In a recent paper by W. H. Scheick, executive director of the Building Research Institute of the National Academy of Sciences, a highly useful and cogent appraisal is made of the present range of research in building and design, and where research must go to achieve the status of a building science.

Rapid strides have been made only in the past ten years, mainly in manufacturers' research, in engineering design of structures and service systems, and in the conception of large-scale building components. And the chemical industry has started a more basic, broad-scale attack on building materials and techniques. But all this is still highly segmented, scattered research in the pattern of the industry from which it emanates, and heavily weighted on the practical, short-range, applied side. There is still here, as elsewhere in the U.S., a great dearth of basic research, which is a concept Americans seem to find most difficult to grasp.

"If we are to make the most of building research," says Scheick, "we must act together to round out the picture as rapidly as possible into a complete Building Science. . . . We *must* have the concept of the completed building as the *end-product of an industry.*" The weakest link in the research chain is the architect-engineer-constructor, the non-manufacturing element in the building profession, which leans too heavily for nearly all its present research on the manufacturer, while chafing and caviling with him over his vested interests. Meanwhile, there is literally no basic research being done around the concept of the building as a whole—the architectural - engineering province — where comprehensive knowledge is woefully short on everything from space to wind pressure, on-site construction operations, the action of ground under slabs, and performance-in-service of all the new products and parts in building.

To get a true Building Science will require a collaboration of disciplines from physics to chemistry, pyschophysiology to economics. Scheick suggests that architects-engineers-constructors make a start by apportioning, as other industries already do, a small percentage of their fees and profits to basic research, independently conducted. Before that is done, society through the medium of clients must allow for fees high enough so this kind of allocation can be afforded.

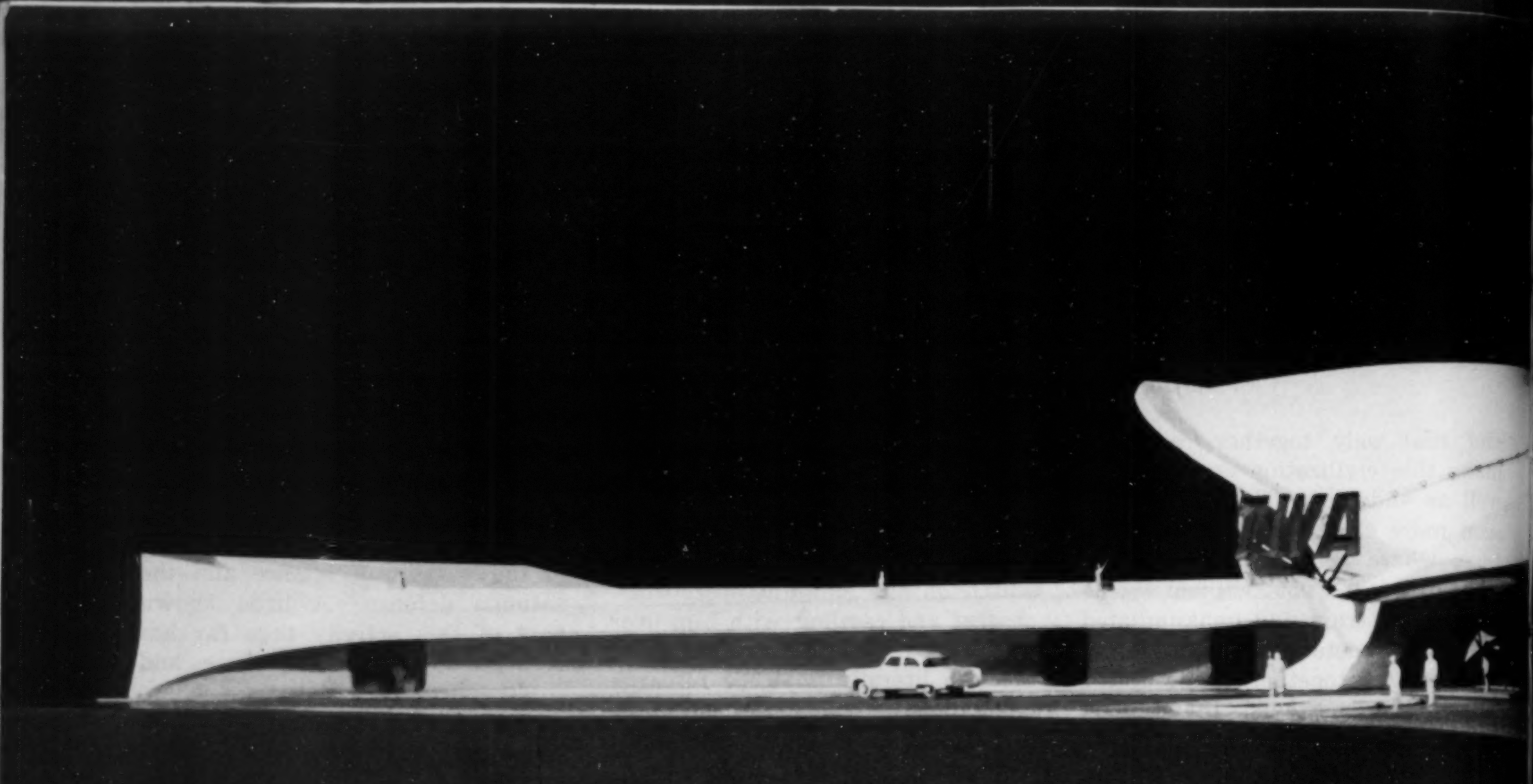
If the professions do not finance basic research, government will eventually take up the task, as it is now doing in England, Canada, Australia, and Russia. For rising costs and enormous world population demands are forcing the evolution of a new economy in building. A symptom of this was the meeting in Chicago last month of a World Construction Conference and a first gathering of the new BRI President's Committee on Coordination of Building Research. Between the pressures of new scientific knowledge and world demand, a new building economy will arise in one place or another, based on research not merely to cut costs but to shape the building more harmoniously to its purposes, no more, no less. It had better arise here.

Architecture in science

For its part, architecture has made great, and will be called upon to make still greater, contributions to the pursuit of science and the national defense. A little known part of this activity thus far has been the design of distant bases and special-purpose buildings, where architecture has adapted itself with remarkable ingenuity to the technical and human requirements of fantastic installations, many on the very rim of the habitable world. The military has gone to the architect and architectural engineer for these tasks because he has shown himself to be the flexible man of ideas for meeting unprecedented situations. And from these situations there is flowing back a fund of new ideas for solving some of the more ordinary problems of building at home and in underdeveloped parts of the world.

Perhaps the most direct of architecture's contributions and challenges in this crisis will be the building of schools and universities, the plotting of the best laboratories we know how. For well over a decade, in physical plant alone, the U.S. educational system has run far behind the tide of need and population, first in the primary, then in the secondary schools. Now we are faced with a doubling of the physical plant in colleges by 1965. To catch up now with ourselves, not merely with the Russians, will require that we bend to the task all the architectural and economic ingenuity at our command.

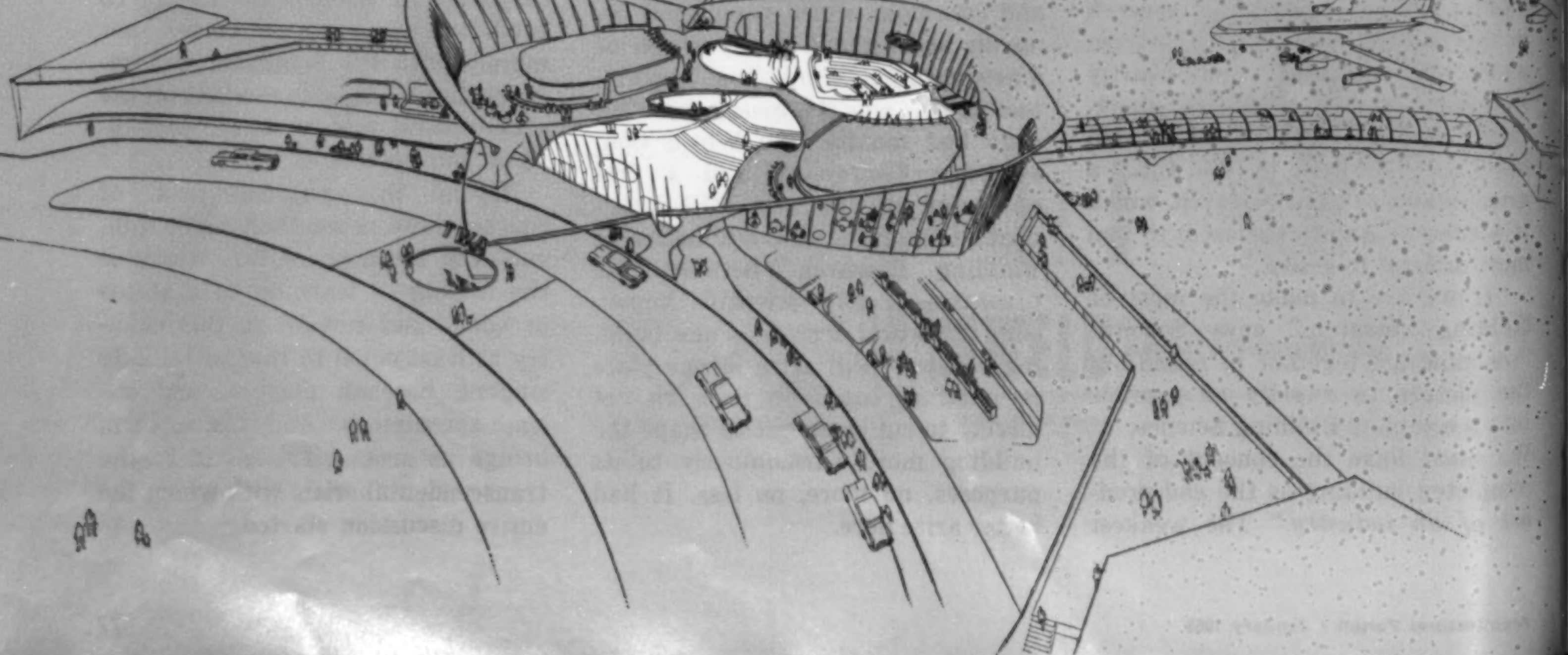
Beyond this physical task, of course, there is another, more difficult and arduous by far, which is the raising of learning to a status of honor and reward in this country at least equal to that of hillbilly singers, baseball players, and oil-lease speculators. And this, in turn, brings us around full circle to the transcendental crisis with which the entire discussion started.

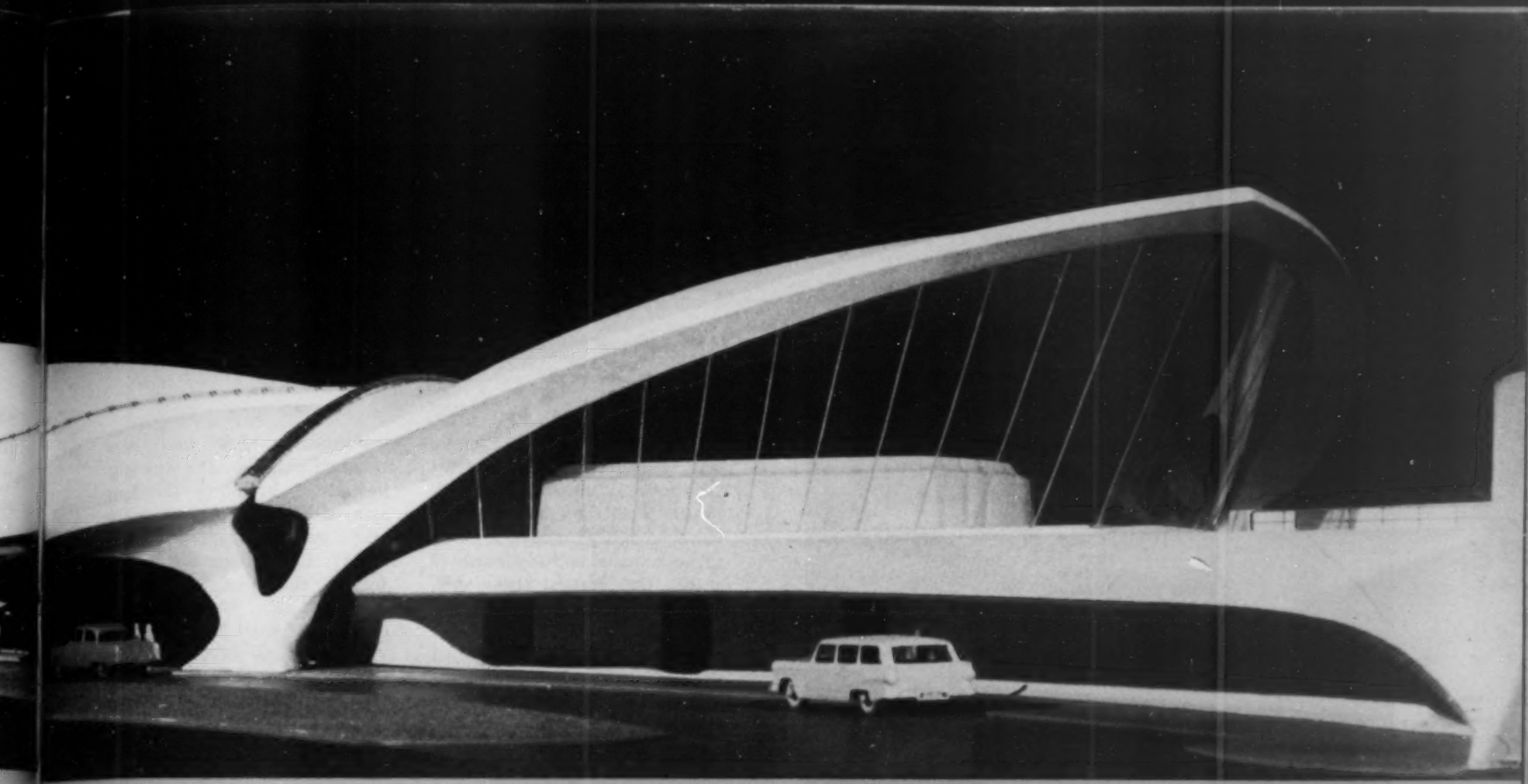


BALTHASAR KORAB

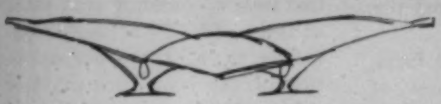
TWA's graceful new terminal

Designed with models instead of drawings, the latest addition to Idlewild's master plan blends the drama of flight with a concrete shell structure and an efficient plan





Roof shells turn into column supports marking each side of the terminal entrance



Looking like a giant bird in flight, TWA's proposed terminal for the New York International Airport, at Idlewild, is obviously an eye-stopping design, appropriate as the symbol of an airline. But if that were the extent of it, the building would be more curious than beautiful. The best evidence that the building is not just a shallow stunt is to be found on the following pages: a report on the intensive and inventive process Architect Eero Saarinen and his associates used in evolving the building's form. Appropriately, this process was more akin to plane design than to conventional methods of building design. Instead of using the age-old techniques of the architect and making complex drawings from which structures would be derived, Saarinen first made *models* from which the drawings were then derived.

In 1960, when the terminal is complete, TWA passengers will be able to judge the results. Certainly, their first impression, as they arrive under the long, curved canopy outside the ticket lobby (lower right in sketch at left), will be of the dramatic and symbolic form. Once inside, leaving baggage and ticketing behind them, they will become part of the drama themselves as they mount the central stairs to the waiting area (see sketch). On the upper level, sitting in the theater-like lounge area, they will survey the operations on the field through a great wall of glass, or, continuing up to the balconies on either side, they will wait, sustained by food and drink, in the restaurants and bar. When their flight is announced, they will proceed to the plane, via moving sidewalks located at each side of the lounge area.

This smooth and luxurious switch from ground transportation to planes will be the most telling evidence that the birdlike form is not mere caprice or design virtuosity. Actually, Saarinen and his associates began looking for the form and the plan of the terminal in February, 1956, by collecting data on planes and passengers, touring existing terminals with notebooks and stop watches in hand, arranging plane positions on a plan of the tight, wedge-shaped site (TWA needed 14 jet-size positions), and conferring with planners of TWA and the Port of New York Authority which will operate Idlewild.

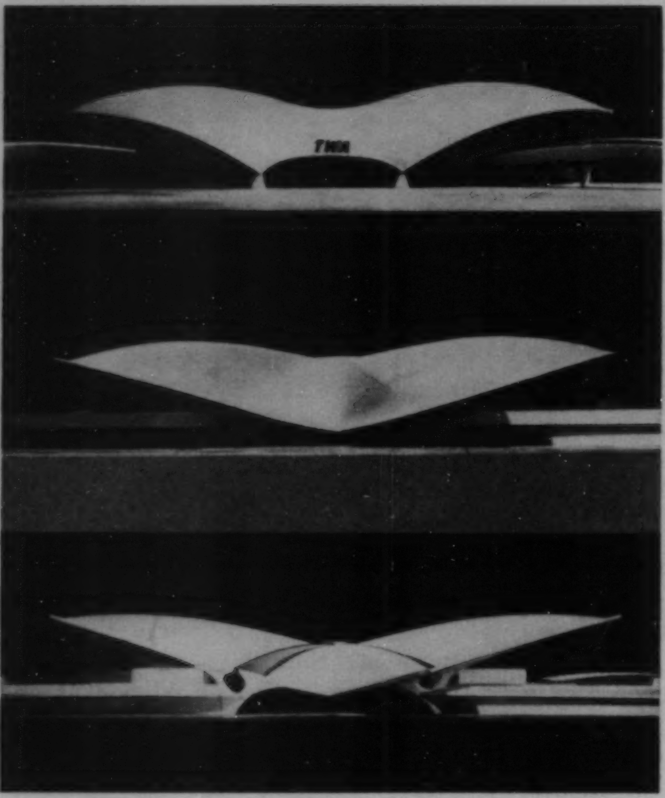
During this period, Saarinen and codesigner Kevin Roche set the key to the planning in their design discussions: the sense of movement, which is an intrinsic part of a terminal, should show in the design.

Their first idea was to shelter this movement between ground transportation and planes under a saddle-shaped, concrete shell supported on four points located close-in toward the center of the building. Saarinen called the form "pigeon-toed," later dubbed it the "Leonardo da Vinci flying machine." But it seemed, at least, a good start.

Modeled in clay at one-eighth inch scale, then molded in plastic, this scheme became the first model, which was reviewed by the architects, the Port Authority, and TWA in July 1956. As it turned out, this was only the first of many such models. After small-scale models came larger and larger models, until one was big enough to crawl in.

Today, this development of the design through models seems obvious. But at the beginning, the designers only felt, as Saarinen put it, "the conviction that architecture is only worth doing if you can make all one thing of a building, so that every detail dovetails with every other detail and supports the whole." Only by the use of models in design could this goal be achieved.

Shaping the roof shells



1.

2.

3.

Three basic designs for shell forms were developed in models

Initially, the model technique was used to design the overall shape of the concrete shell structure. Although many ideas were roughly modeled, only three reached a fully modeled stage. The first of these shell forms (1), called "pigeon-toed" by Saarinen, had two faults: it did not follow the curve of the street, nor did it express the movement of passengers through the terminal. Preliminary studies revealed other faults: the edge beam would be exceptionally heavy because of the great cantilevers at each end of the shell, which would itself have to be very thick because of the low rise. As Saarinen put it: "the shape was really working against the structure."

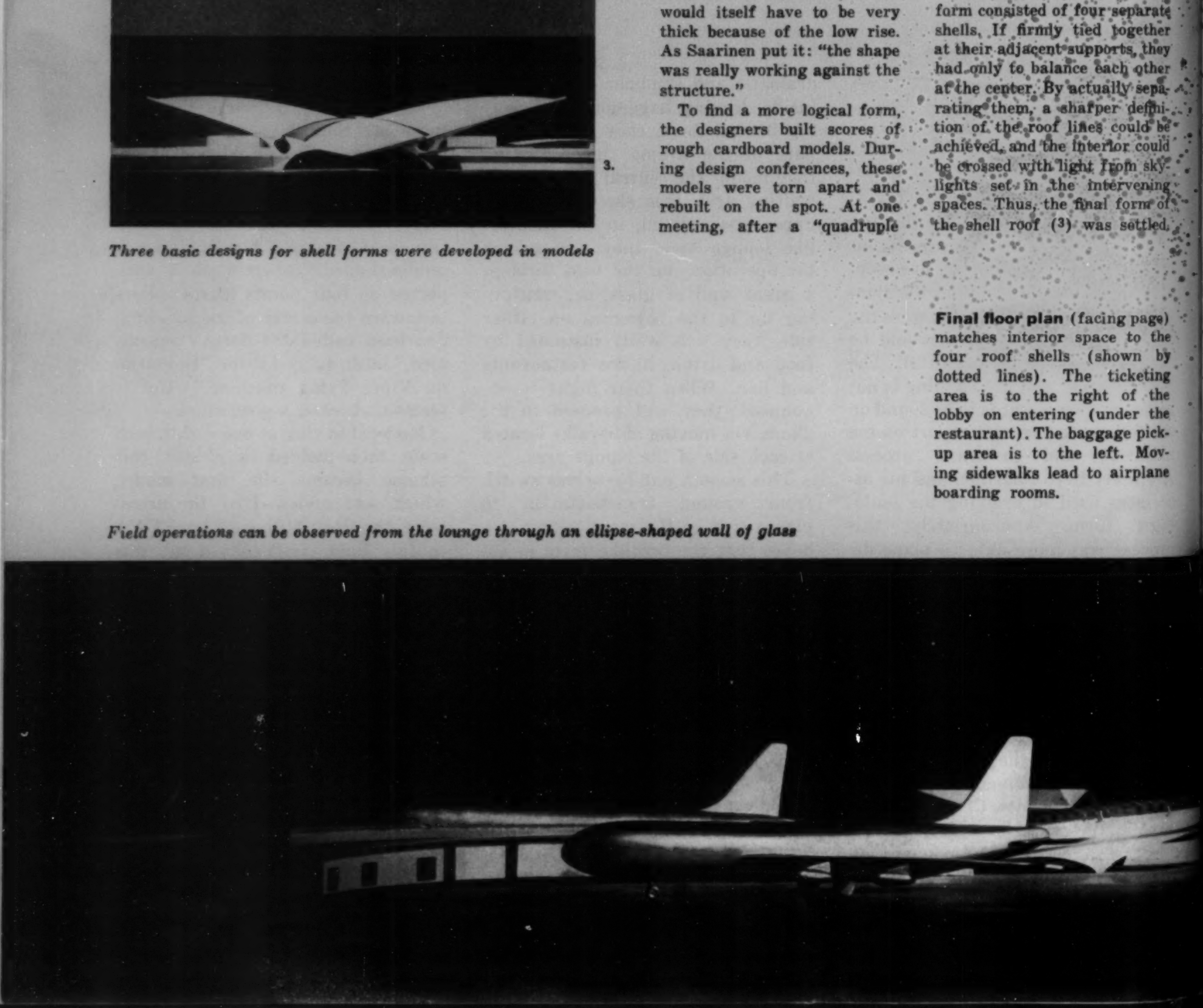
To find a more logical form, the designers built scores of rough cardboard models. During design conferences, these models were torn apart and rebuilt on the spot. At one meeting, after a "quadruple mushroom" shell had been roughed out, the idea was suggested of breaking the long axis of the roof to match the curve of the street (see plan right). Codesigner Roche performed the operation directly—with a saw. Thus was born the second shell form (2).

This broken axis solved two additional problems: it spread the field-side supports to coincide with the moving sidewalks to the boarding rooms, and it allowed the smaller forward shell to reach out as a shelter for the main entrance.

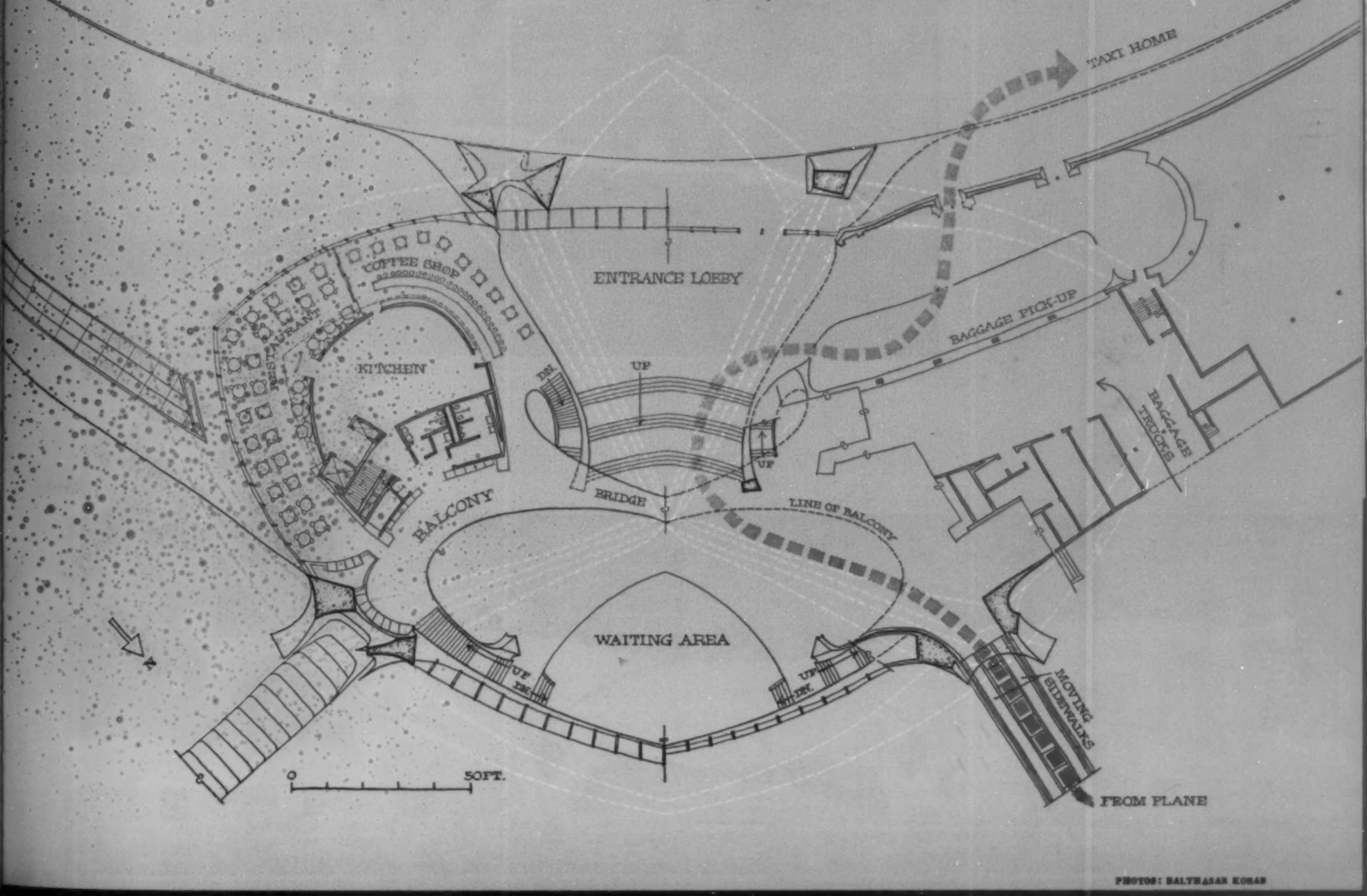
Basically, however, the new form consisted of four separate shells. If firmly tied together at their adjacent supports, they had only to balance each other at the center. By actually separating them, a sharper definition of the roof lines could be achieved, and the interior could be crossed with light from skylights set in the intervening spaces. Thus, the final form of the shell roof (3) was settled.

Final floor plan (facing page) matches interior space to the four roof shells (shown by dotted lines). The ticketing area is to the right of the lobby on entering (under the restaurant). The baggage pickup area is to the left. Moving sidewalks lead to airplane boarding rooms.

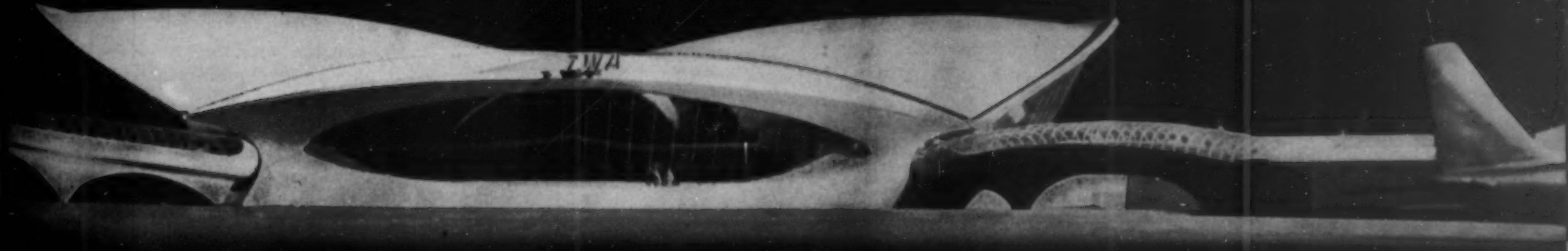
Field operations can be observed from the lounge through an ellipse-shaped wall of glass

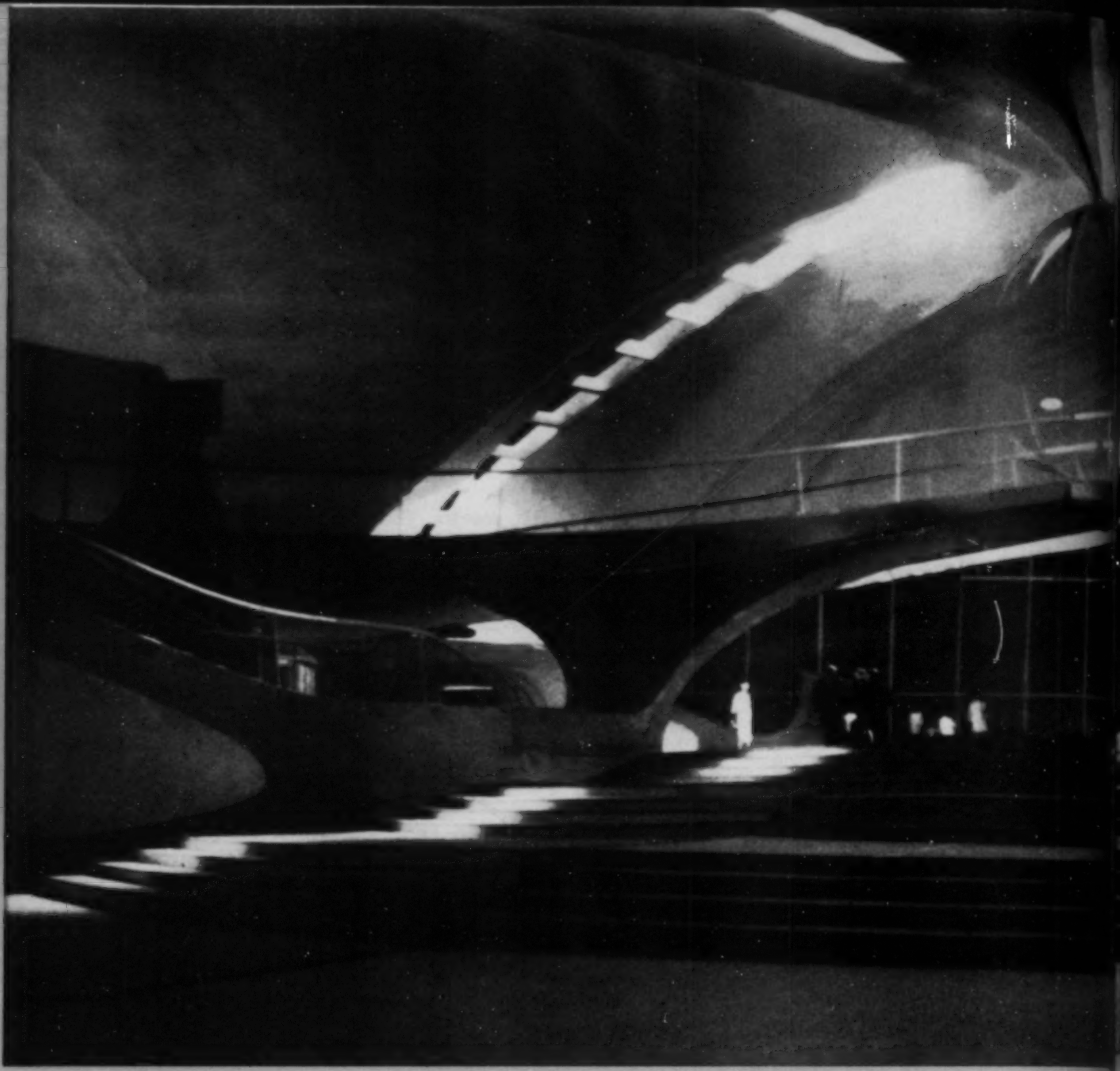


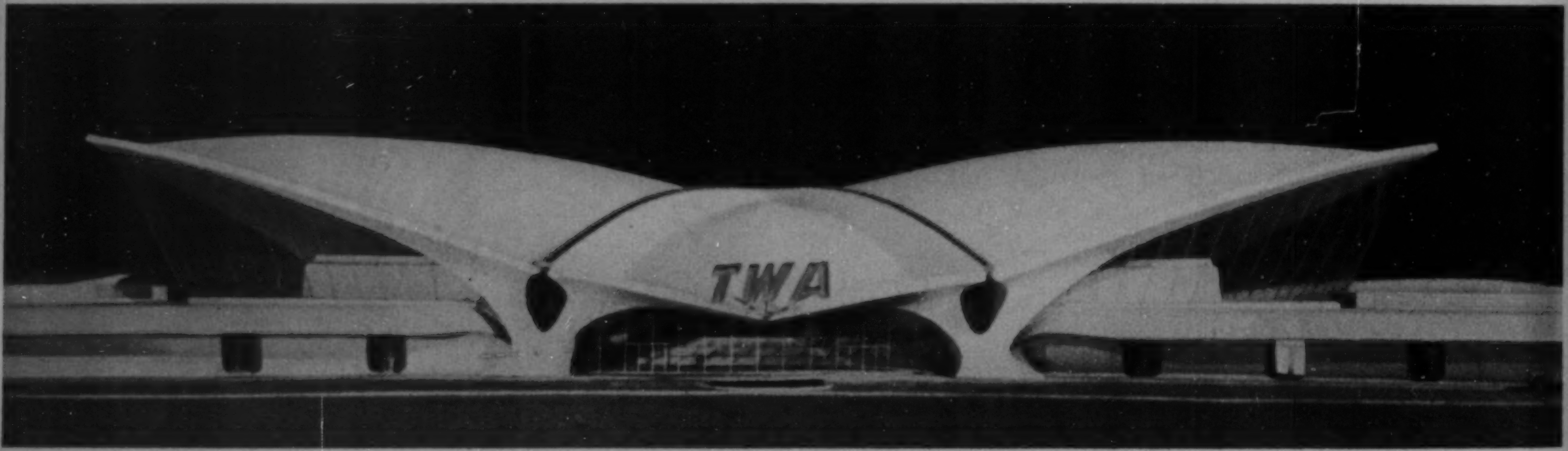
Designers at work: Cardboard cutout of the bridge connecting upper balconies (center, plan below) is held in place by Eero Saarinen (center) as codesigner Kevin Roche (next right) and design staff members consider it. This model allowed the team to cut and try, test, and discuss. Project Manager William Gardner also found the model helpful in discussions between designers, staff, consultants, and clients.


TAXI HOME
ENTRANCE LOBBY
COFFEE SHOP
RESTAURANT
KITCHEN
BAGGAGE PICK-UP
UP
DN.
UP
BAGGAGE TRUCKS
BALCONY
BRIDGE
LINE OF BALCONY
WAITING AREA
UP
DN.
UP
DN.
MOVING SIDEWALKS
N
0
50FT.
FROM PLANE

PHOTOS: BALTHASAR KORAB





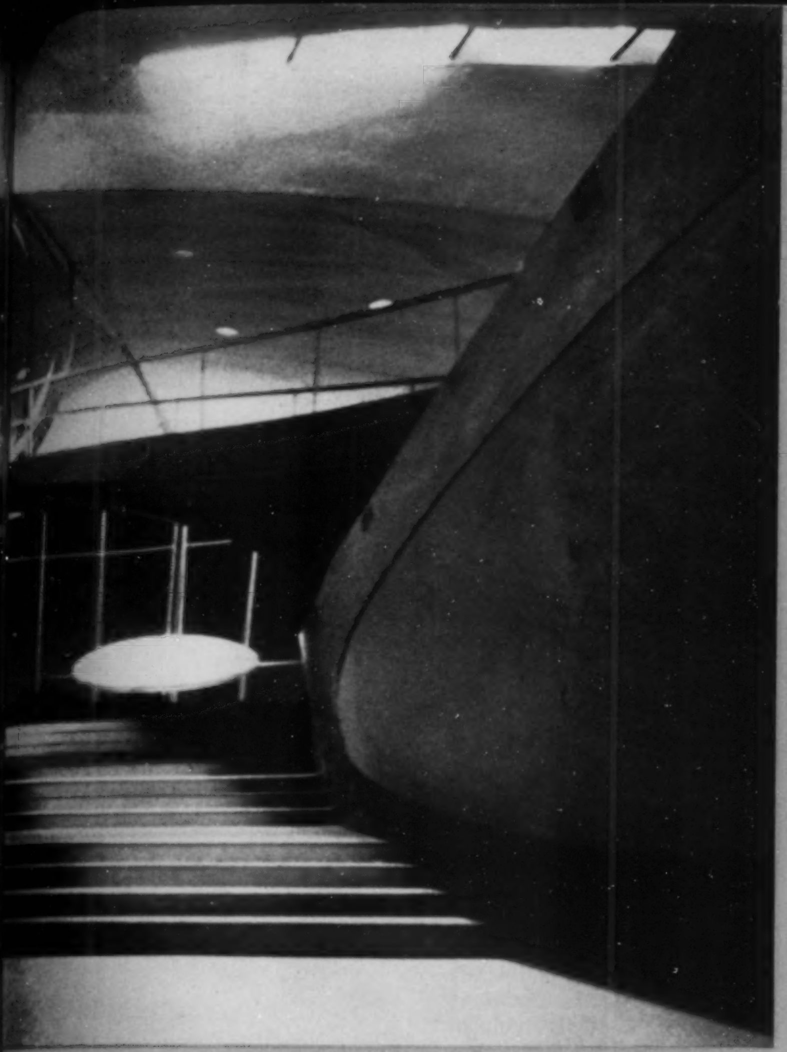


Modeling the terminal interior

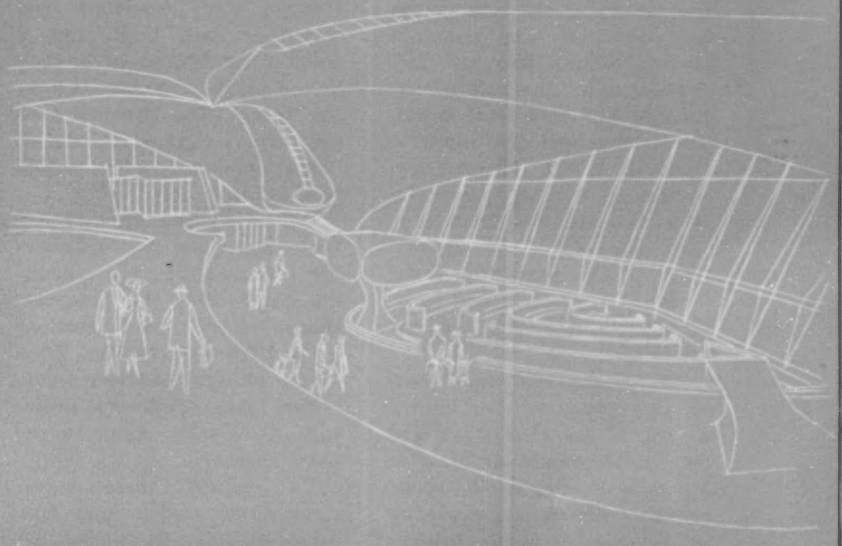
In designing the interior, the design team found it necessary to build (and rebuild many times) a large-scale interior model. This three-quarter inch model was first built to cover only the area immediately around the front entrance (top photo), because, it was felt, all the problems centered around the front supports. Gradually, however, the model was increased: first, to cover the center of the interior, where the broad stairway links the entrance lobby to the waiting area, and then, to cover one-half of the entire space under the shells. Because the building was symmetrical, a picture of the whole space could be obtained by placing a mirror on the edge of the model at the center axis.

The area around the central stairway was remodeled at least ten times. "Gradually we evolved a more flowing line," says Saarinen, "for the bridge connecting the balconies, the stairways leading to them on each side, and the surfaces around this stairway."

In the waiting area (model, photo right), the edge of the balcony and the stairways next to the window overlooking the field were modeled, until the entire area had a flowing continuity of line and form, visually coincident to the flow of passengers.

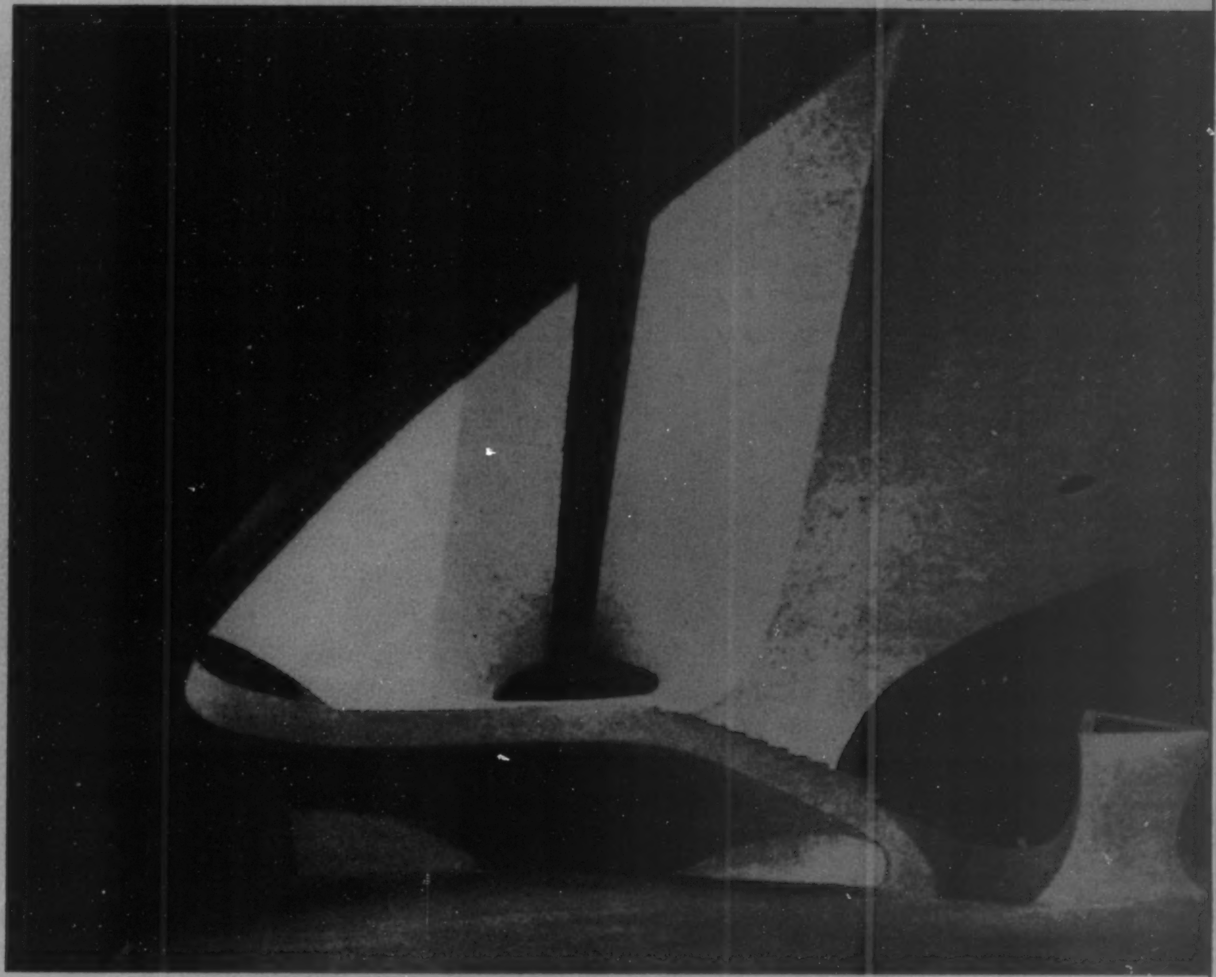


TERMINAL FOR TRANS WORLD AIRLINES, INC.
New York International Airport, New York, N. Y.
ARCHITECTS: Eero Saarinen & Associates
ENGINEERS: Ammann & Whitney (structural)
Jaros, Baum & Bolles (mechanical)
CONSULTANTS: Stanley McCandless (lighting)
Aviation and Engineering Depts.,
The Port of New York Authority

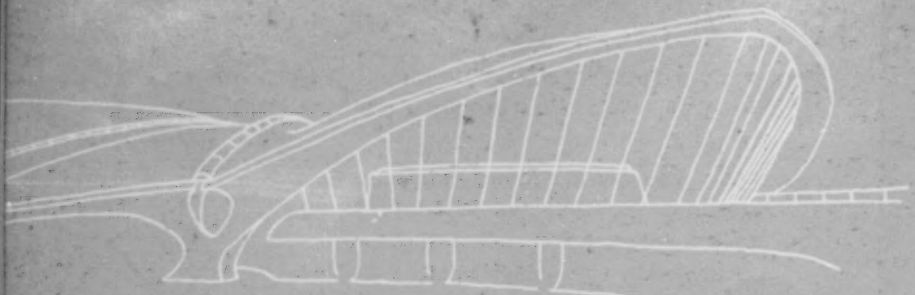


Bridge connecting the balconies crosses the monumental stairway leading up to the waiting area from the entrance lobby. Sketch right shows waiting area, with plane announcement board in the center.

PHOTOS: BALTHASAR KORAB



Under the balcony, passengers step onto a moving sidewalk to the boarding rooms. Above the balcony, a band of glass (dark in the photo) separating the shells terminates in the elliptical space between the shell supports. The two shell supports merge together below the waiting-room floor level.



The sculpture of the front supports

The design of the columns on each side of the entrance (sketch above) was still unresolved after the rest of the building had been worked out. Unlike the field-side supports (through which the bridges containing moving sidewalks were pushed), the front supports were to be of minimal size. At the same time, the thrust of each shell had to be carried to the foot of the support.

The reaction of each shell on the support (due to the weight of the shell itself and the varied conditions of wind and snow loading on the structure as a whole) was expressed in a model (photo below). Heavy wire described the thrust of each shell from a point of application in the shell to the range of application at the foot. (The directions of the thrusts change because of varied application of snow and wind loads on the shells.)

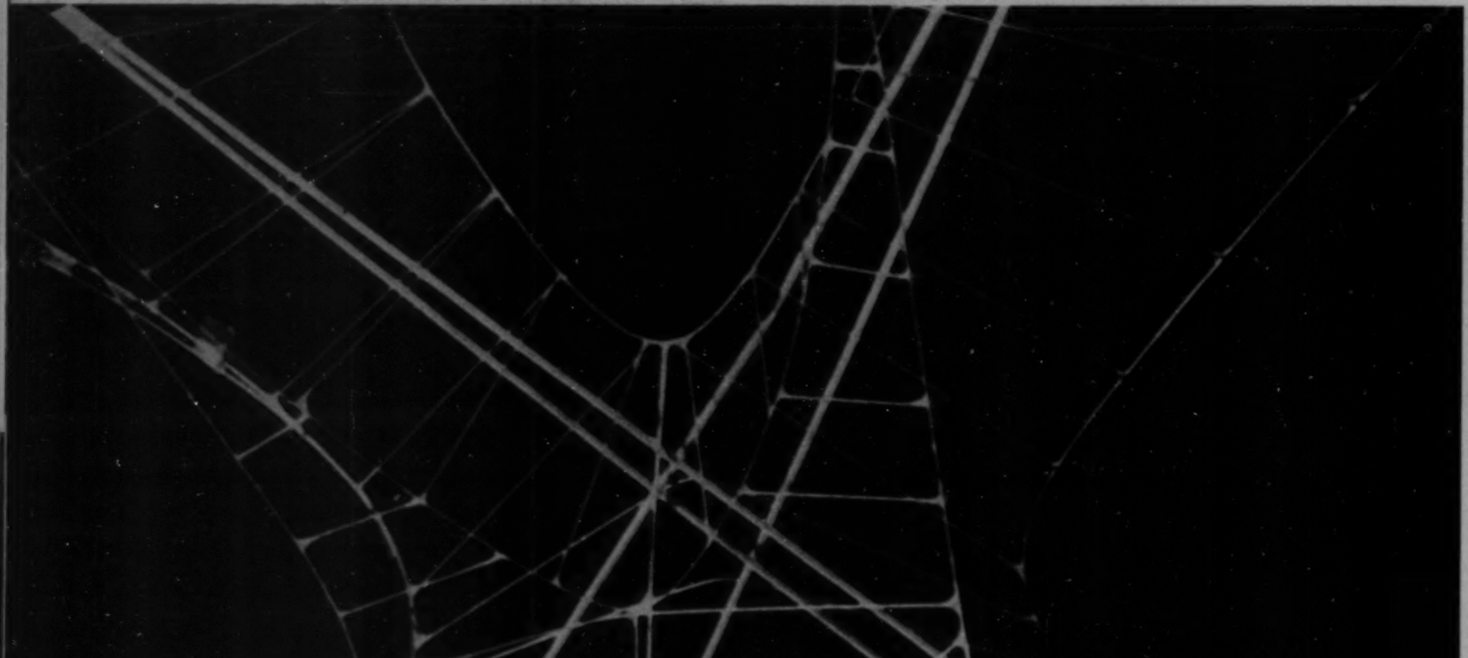
Guided by the area needed for concrete and steel reinforcing (calculated by the consulting engineers), the designers shaped light wire sections around the heavier wire. Then a skin of light cardboard converted this open-wire sculpture into a solid volume (model photo, right).

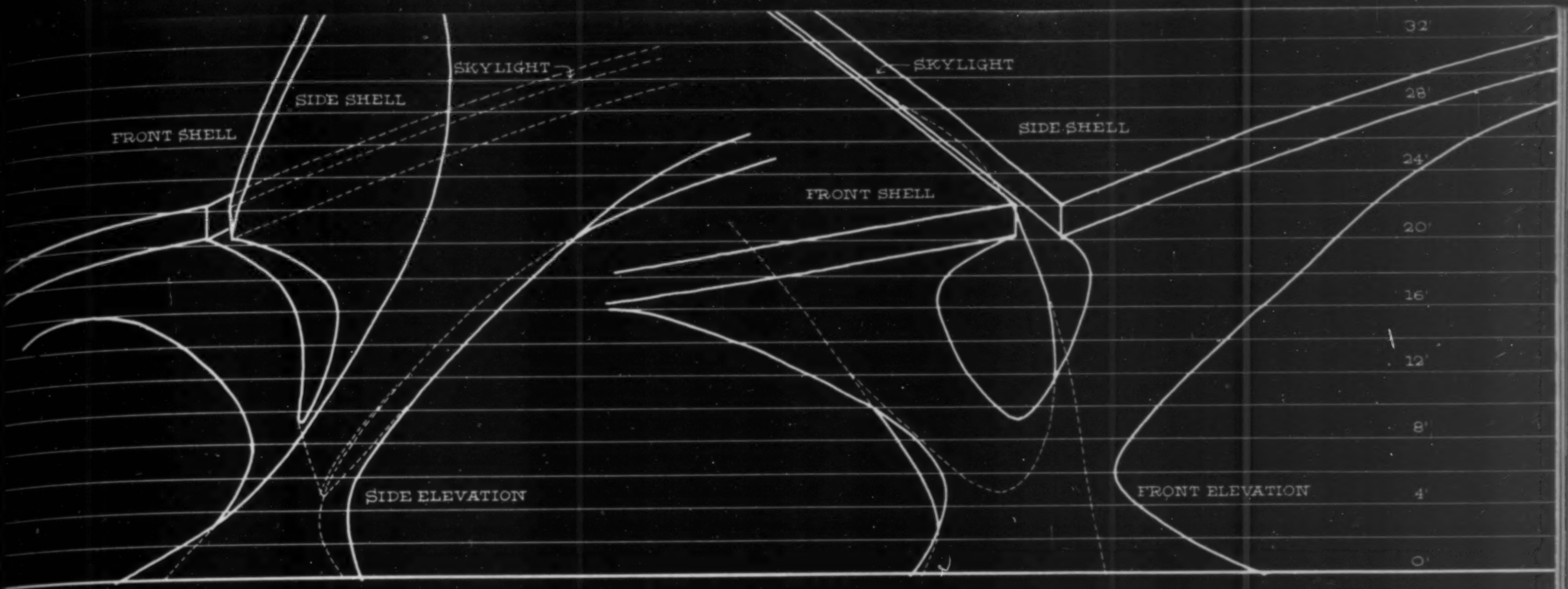
To convert these three-dimensional models into two-dimensional elevations (sketches top, right) required the use of all manner of techniques and mathematics, including some familiar only to molders, pattern makers, and contour surveyors. Another method was to photograph the model, thus putting it in two dimensions for measurement.

"One of the happiest days," says Saarinen, "was after we had worked out the supports in model form. Finally we were able to make drawings of what we actually had. In these drawings, we found that the support plans (see floor plan, page 81) were marvelous-looking things, showing forms that could never have been arrived at on paper."

Front supports were shaped first in wire (below), then covered with cardboard (photo, right). Drawings (top, right) show the final form in two elevations.

PHOTO (BELOW): HELMUT BORCHERDT; (OPP. P.) BALTHASAR KORAB




FRONT SHELL
SIDE SHELL
SKYLIGHT
SIDE ELEVATION
SKYLIGHT
SIDE SHELL
FRONT SHELL
FRONT ELEVATION
32'
28'
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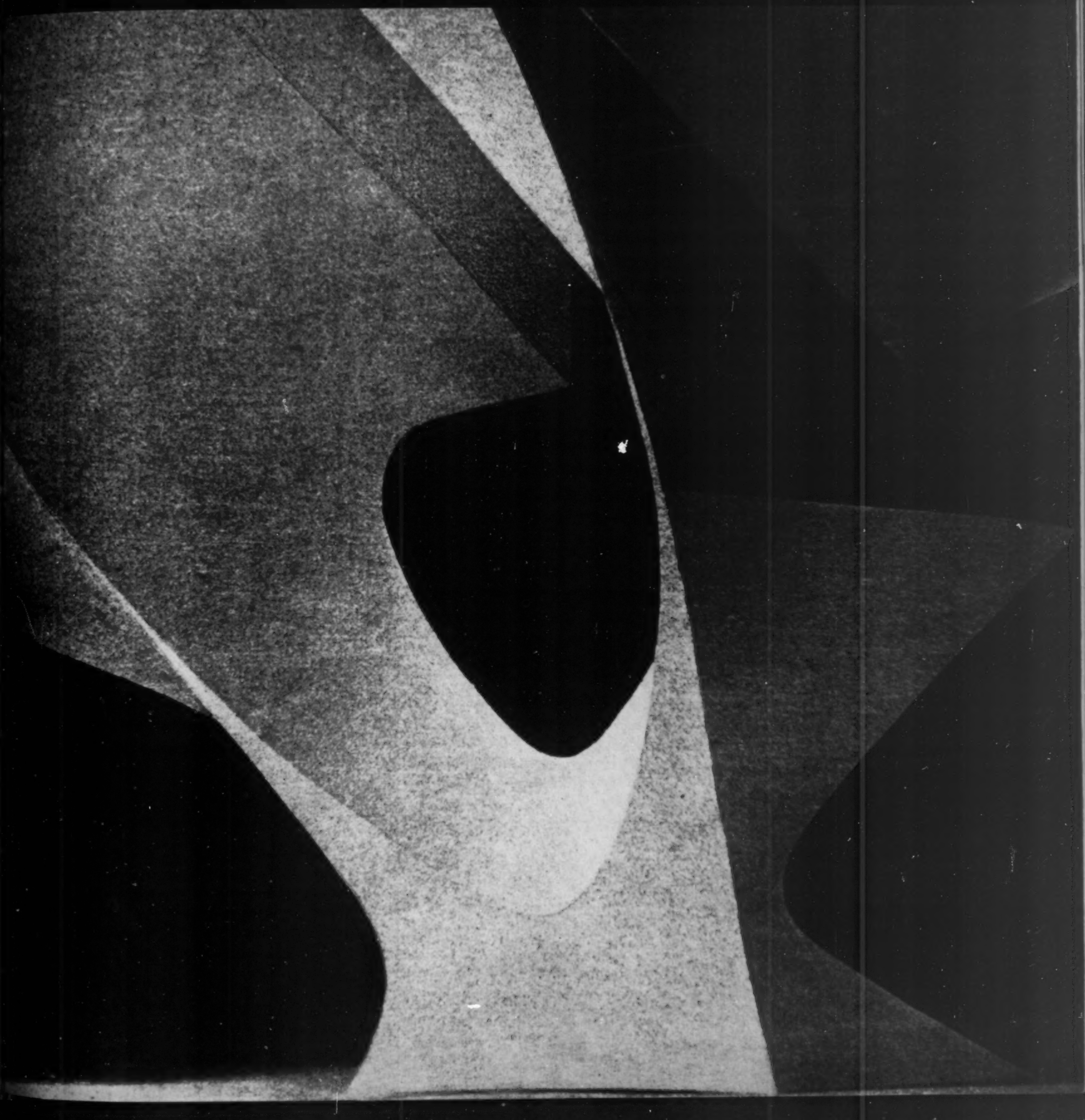
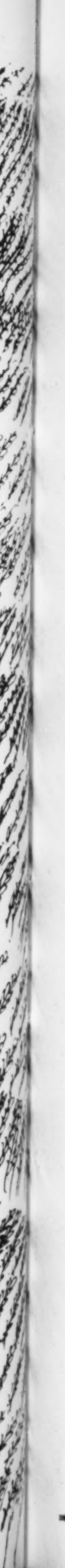
20'
16'
12'
8'
4'
0'





DRAWING BY BOB GILL

The city's threat to open land

The aimless sprawl of suburbia is destroying a precious asset. How can we preserve vital breathing space in our explosively growing metropolitan areas? A round table report

Each day the bulldozers munch farther outward from the cities. Each day close to 3,000 more acres of the contrasting landscapes of man and nature ooze together into the unrelieved suburbia and roadtown that is fast becoming America for most Americans.

The 19 experts listed on page 90 were recently invited to a round table conference sponsored by FORUM and FORTUNE to figure out how to steer the bulldozers before it is too late. The experts did not waste time discussing whether there is a problem. They had seen it. Some came from the San Francisco Bay region, where orchards are toppling and housing tracts zigzagging over pockets of incredibly rich topsoil, in a pattern ugly with the ugliness of wanton waste. Some came from the Philadelphia area, where the beautiful valley of the Brandywine is threatened by the inexorably advancing drive-ins, building tracts and neons. Some came from New York, where the rains of western Long Island, unable to percolate through uniform new carpetings of roofs and roads, are now scant guard against intrusion of salt water. Some came from the national capital area, where whole counties of rolling land are being swallowed in repetitive suburbia, with not even the equivalent of Washington's Rock Creek Park saved out. Some came from New England, where the subdivision signs are going up on the Truro moors within sight of the last magnificent stretch of pristine beach on the Atlantic mainland. Furthermore, they all came well aware that these despoilings of the great American inheritance are not exceptions. They are painful symbols of the rule of the unloosed bulldozer in Chicago-Detroit-Cleveland or Albany-Troy-Schenectady or Norfolk-Newport News-Portsmouth or Houston or Los Angeles-San Bernardino-San Diego or any of several dozen other vast city sprawls in the making.

Is the cliché true that this is progress, and you can't stop progress? The round table participants thought that endless sprawl was no more progress than erosion is progress and that sprawl *must* be controlled. Because by 1975, 42 million more people, a staggering increase of 44 per cent, will pile into the metropolitan areas. Most of them will move into what is now thin suburbia or rural fringe or breathing space between separate cities. Even to grasp the fact of this 44-per-cent metropolitan population increase does not convey a picture of the added sprawl it represents. For example, the New York Regional Plan Association estimates that the New York–Connecticut–New Jersey metropolitan region, which now contains 15.5 million people and 1,100 square miles, will increase 25 per cent in population by 1975, but because the current pattern of growth is sprawl, the increase in area will be a huge 64 per cent—another 700 square miles.

State responsibility

The problem seemed "insoluble" to some participants at the opening of the discussion. It is so staggeringly big, it involves so many people, so many interests, so many kinds of land and enterprises. Intellectually, the problem is not hard to grasp—it is as simple as the human need for contrast in life, for recreation, for amenity, for space to breathe in, for the feeling that there is a solid footing to life on this planet. But practically, whom in the great metropolitan sprawl do you tell this to, how do you get the breathing space, and who does the job? Can it possibly be done without vast governmental powers, a new regulatory bureaucracy, or huge tax expenditure?

By the close of the two-day discussion, the participants were convinced that open land can be saved, and moreover this job can be done by already familiar and acceptable political agencies and powers. Specifically, the round table recommended that an open land program should be carried out by the states at the behest of leaders from local metropolitan and rural areas; it could employ existing state powers for conservation, highway mapping, water planning and the like, filling these in where necessary with state legislation (for some precedents, see below). The program should include preservation of privately owned, "living" open land, such as farms and forests, the owners being recompensed for keeping the land open in the public interest. Such a program would take money, but in relatively modest amounts; a few million dollars used judiciously will preserve a lot of open land for a metropolitan area *if* it is spent soon. Moreover, not all land bought will represent a net expense; some can be income producing (see Conservancy Districts, page 164). Techniques and funds are of the essence, but they are not the major problem. Local leadership to start and to push an open land program is the urgent need.

Leapfrog and hopscotch

The trouble, the round table participants agreed, is not that we lack sufficient land for metropolitan growth—even though so many of our favorite enterprises, such as shopping centers, superhighways, horizontal factories, high schools and airports, are voracious land-eaters. The trouble, as any detailed map or discerning look shows, is the leapfrog, hopscotch, and string pattern of development. The round table called this "scatteration." Scatteration actually leaves in its wake and at its flanks astonishing amounts of open space. But the open space counts for nothing. It bears no relationship to soils, water, topography. It is too random, too formless, too inefficient; often it is too blighted even to retain its attraction as a place to fill in. Meantime, the open land beyond, where speculative hopes are not yet so high, is always cheaper. Scatteration thus threatens to be a permanent waste, not a transition pattern as has been assumed.

Analyzing the question, "Who cares?" the participants agreed that scatteration is bad for almost everybody. It is bad for utilities, whether private electric lines or public sewer lines, because it means low-volume operation; and it destroys essential watersheds within easy distance of consumers, constantly increasing urban water problems. It is bad for

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How to keep land open: some useful precedents

The best research program on how to get **open land will** come from an action **program. What** we now know about likely **techniques** for preserving open space derives from past experimentation; to learn **more we** must experiment more. None of **the following** examples of action already **tried is a** complete open land program, **or even an** adequate framework for one. **But these** are the kinds of ideas on which **an open** land program can be built.

Rights and easements

The Bay Circuit Act, passed in Massachusetts in 1956, established an outer **Boston green belt** designed to intercept the **advancing** sprawl from Providence, Lawrence, and Lowell. The Act provides for **"a system of** *privately* and publicly owned **open spaces."** The State Commissioner of **Natural Resources** may, among other powers granted by the Act, "accept any deed . . . containing reservation of easements." The Act shows a clear recognition of the public value of privately owned open land and provides a tool—the public purchase of development or scenic easements—to insure the preservation of this open land, even under changes of ownership.

Washington's National Capital Parks and Planning Commission has been empowered since 1926 to take "lands and *rights in land* for public open spaces." Only "public open spaces" are mentioned; this was a precedent to the Bay Circuit Act.

The U.S. Bureau of National Park Services has acquired some scenic easements, especially in connection with the Shenandoah parkway, but has developed no enforcement machinery, a very serious weakness.

Maryland's and Ohio's highway departments have experimented with roadside easements, with very different outcomes. Maryland enacted into law the right of its highway department to acquire by condemnation several kinds of easements (e.g., control of shrubberies, building of certain types of structures), in sum amounting to development rights. Acquisition was mainly in already urbanized areas. The acquisition costs of the easements were almost as high as the cost of the land itself and yet owners were antagonistic.

Ohio, on the other hand, has been acquiring highway development rights and easements, called "reservation rights" in rural areas only, and by negotiation, no condemnation. Costs have been remarkably low ($5 per acre) and the department regards the program as a success.

The Navy is using easements and development rights to create safety areas around jet bases. The 32,000 acres for a

continued on page 164

transportation, highway or transit, both of which work best when they carry traffic from a definite Here to a definite There, and traffic generation in between is held to manageable proportions. It is bad for industry, which is limited by water, transport and drainage to relatively few sites in the metropolitan orbit and must increasingly take, along with these, environs wildly fouled up.

Scatteration is bad for developers—not those who pull out, but those who have shopping centers or other continuing investments in their developments—because an endlessly sprawl-engulfed backwash will be a deteriorating property. It is bad for the millions of buyers of FHA lots and houses and for the investors behind them. It is bad, most of all, for people as people, for the suburbanites who lose the thing that drew them to the suburbs, for the central city residents whose recreation grounds and amenities keep retreating, for everybody who feels a sense of personal loss when his local equivalent of the valley of the Brandywine goes under.

The farmer in the trap

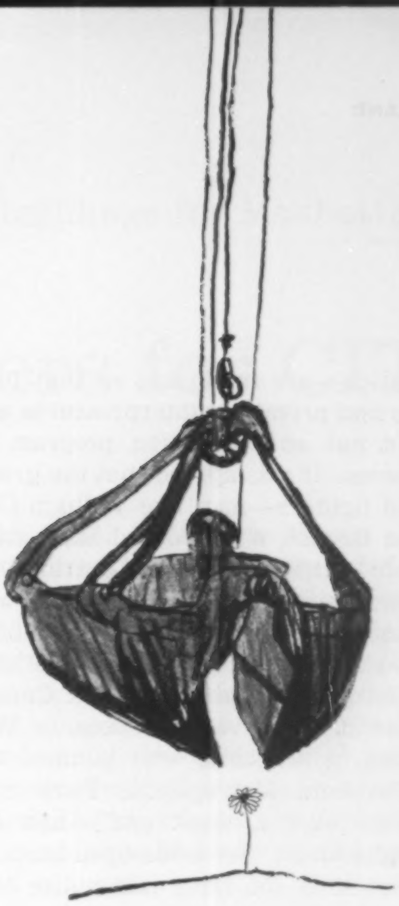
And it is bad for farmers, particularly those on Class I farmland, who have been discovering that it is difficult to replace the farms they sell to developers with others of equivalent productivity. Class I farmland accounts for only 10 per cent of the U.S. cropland and only 3.8 per cent of total land, but it produces close to 20 per cent of the total crop values.

About half of the Class I acreage in the U.S. is concentrated in the Middle Western agricultural heartland; but *the other half is largely in and around the growing metropolitan areas.* It may make sense to retire surplus farmland as a solution to the perennial problem of farm surpluses, but it is economic nonsense to retire (and destroy) the most productive, rather than marginal, land. And even in a time of agricultural surpluses, massive loss of Class I farmland is no joke, for it is a really rare bounty on earth. All of Russia, for example, has little more Class I farmland than we have. Furthermore, it is precisely such land, living, well-tended, prosperous, which is one of the delights of the suburbanite's eyes and soul.

Yet the farmer, willy-nilly, has no choice but to sell when sprawl entraps him. His assessments and taxes go up intolerably. He loses land by condemnation to schools and other new community necessities. (A man who loses a quarter of his truck farm or orchard might as well sell all; he cannot make a living at three-fourths' capacity.) Significantly, the most instructive current experiment in an open land program has been initiated by farmers (in Santa Clara, Calif.—see page 164).

Here is a clear case where rural and urban interests are in fundamental accord. Their interests, moreover, are in accord with those of many special groups—the conservationists, the recreation organizations, the Izaak Walton leagues and garden clubs, the watershed councils, and the park services—all the people who understand that a city survives by grace of a hinterland.

Many such groups push for preservation of open land, but they have seldom joined forces. The test of a good open land program in any area will be whether it unites logical allies, and particularly whether it gives the farmers what they consider a fair deal. For farmers have a dominant voice in most state legislatures, and this time the rural bias of the states can be a godsend to the cities.



Actually there is no such thing as "unused" open land.* To remain open may be by far the highest use of a piece of land in both the public and private interest. Scatteration, the participants agreed, has outdated the old concept of "developed" versus "undeveloped" land — the concept that a favor is done for any land when it is built on.

The more practical the round table participants became about the problem of preserving open space, the less they hankered for comprehensive studies, comprehensive statements, comprehensive educational campaigns before taking action. There was a gradual switch of all concerned to the search for expedients on which action could be started forthwith.

Three actions, it was agreed, are necessary: 1) open spaces big enough to count must be left open permanently amid the sprawl so the country will not be a continually retreating mirage; 2) more concentrated development must be fostered in the spaces between; 3) other public activities, especially highway construction and watershed conservation, must be coordinated with the open-space program.

The key action, among these three, is to acquire the land—or rights in the land that control its use (see precedents, page 88). Without the acquisition, there is no open land program. The other two jobs—fostering of concentration, and coordination—are important so that public and private counterpressures will not cut an acquisition program to pieces. It was agreed that the grand old fighters—men like William Cullen Bryant, who aroused Manhattan into setting aside the Central Park reservation, or Charles Eliot, who pushed the Boston Metropolitan Park System, or Dwight Perkins, who goaded Chicago's Cook County Forest Preserve into being, or William Stinchcomb, who planned the Cleveland Metropolitan Park System "over a week end"—had the right idea. "Set aside open land before it is too late; rationalize how right it was later."

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*The round table participants enumerated these uses of open land: agricultural; forest conservation and timber; public and private recreation (including shore lines); bodies of water themselves, for drainage, for reservoirs; watershed and wildlife conservation; space for highways and utilities, such as power lines; industrial open space, including agricultural-based industry; space for amenity, including historic sites and scenic areas; safety margins around airports; military maneuver grounds, testing areas and bases.

But who does it?

Experience has shown that an effective program for acquisition of open land could not be carried out by localities separately, especially by the fragmented municipalities and counties which typically compose the metropolitan suburbia and fringe. Even supposing an impossible altruism, they could not afford to subsidize by themselves the open land needs of the metropolis. Nor is zoning *by itself* an effective tool. It has proved too subject to short-run pressures. Nor is there point in banking on eventual creation of metropolitan governments. Before that infinitely more difficult aim is achieved, the land will be gone.

After very thorough discussion, it was agreed that most of the measures must be taken by the states.* The state has the highways to map and water systems to lay out; for these and other purposes it is acquiring land already and appropriating money for it. The planning of open space is an expansion and rationalization of what is already being done. The powers needed to acquire the land or the rights in it derive from the state in any case. Most equitably, since the program will benefit many separate local jurisdictions, the funds for acquiring open land should come from the state too, either out of general revenues or earmarked income (possibly with local participation). The state is also the only conceivable body (because of its control of vital public service policies) that can foster concentration of development in place of scatteration.

But the impetus for state action must come from local leaders—business, utility, transportation, and industrial, as well as political and civic leaders—in the metropolitan area, together with leaders from the rural interests involved. There can be no intelligent legislation without informed, intelligent pressure.

Action first

As the acquisition agency, the participants suggested it would be most expeditious to use whatever department of the state government that already has the most effective power in the realm of land—expeditious both for getting the program started and for guaranteeing its long-run effectiveness. However, the political and administrative realities in each state must determine whether it is wisest to use an existing agency (e.g., a department with major responsibility for natural resources or for public works) or whether it is wisest to set up a new land agency, or to merge several relevant agencies, or whether the state should delegate its powers to a district land agency.

Whichever agency is chosen for prime responsibility, it is vital that it be an *action* agency, with the power and funds for acquisition. It should not be a coordinating body, an advisory body or a planning body. It should have its own planning staff, working closely with city, state, county or regional planning

continued on page 166

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*Dissent: Ackerman, Owen and Intermaggio think the round table underestimated the potential role of the federal government. Ackerman and Intermaggio also think the importance of agricultural land and interests in the metropolitan area was overestimated.

Round table participants

GOVERNMENT AND LAW

CHARLES ABRAMS, *chairman*
N.Y. State Commission against Discrimination

EDMUND BACON, AIA, *director*
Philadelphia City Planning Commission

KARL BELSER, *director*
Santa Clara, Calif., Planning Department

LUTHER GULICK, *president*
Institute of Public Administration

CHARLES HAAR
Harvard Law School

BERNARD HILLENBRAND, *director*
National Association of County Officials

DEVELOPMENT

JAMES SCHEUER, *chairman*
City & Suburban Homes Co.

STUART WALSH, *director*
Industrial Planning Associates

TAXATION

MABEL WALKER, *executive director*
Tax Institute

ECONOMICS AND PLANNING

EDWARD A. ACKERMAN
Resources for the Future

CATHERINE BAUER
University of California

CHARLES W. ELIOT
Harvard University Graduate School of Design

HENRY FAGIN, *planning director*
Regional Plan Association

CARL FEISS, AIA
Planning Consultant

JOSEPH INTERMAGGIO
Committee on Urban Research,
National Academy of Science

PAUL B. SEARS
Yale Conservation Program

RECREATION

JOSEPH PRENDERGAST, *executive director*
National Recreation Association

TRANSPORTATION

DAVID R. LEVIN
U.S. Bureau of Public Roads

WILFRED OWEN
Brookings Institute

PRESIDING

DOUGLAS HASKELL, *editor*
ARCHITECTURAL FORUM

WILLIAM H. WHYTE JR.
assistant managing editor, FORTUNE

Two notable new office buildings for Manhattan

1. A squat headquarters for CIT

The corner of Madison Avenue and 59th Street is about midway between New York's tense advertising world and its graceful art gallery world. On that corner late last year CIT Financial Corp., largest independent U.S. commercial credit firm, opened the crystal doors of a new headquarters built of granite, steel, and glass. The chief feature of the building: an unusual blend of efficiency and elegance.

The building achieves its elegance mainly through its height, which has been held to a seemingly uneconomical eight stories. The decision to keep the building low came partly from CIT's reluctance to get involved in running and renting an office tower. CIT's business is lending money; the company's management saw nothing to be gained by going outside their field. "It is true," remarked Executive Vice President Henry Ittleson Jr., "that the provision of rentable space would produce income, but such a program would require that we get deeply involved as real estate investors and operators, which we

PHOTOS: J. ALEX LANGLEY

Cut and polished, granite gives the stone façade of the CIT building a handsome polish. Above the building's low silhouette loom the more conventional towers of New York's midtown.

do not consider ourselves to be."

Other explanations for the building's height are largely esthetic. Architects Harrison & Abramovitz realized the appeal of a low form set between gangling skyscrapers.

The low height and the fact that the project was frugally financed from surplus funds also made it possible for CIT to utilize a rich granite façade. The granite sections of the building's face are 2 inches thick, set in stainless steel frames, and given the latest curtain-wall treatment. The cost of this polished, conservative facing was $382,500 ($8.50 per square foot) as against an estimated $270,000 ($6 per square foot) for an embossed aluminum façade of the same area.

The building's richness is more than skin deep. It extends from the unusual ceiling height (9 feet, 3 inches) to the floor-to-ceiling doors; from the deep narrow windows between hidden columns to the executive-style greenery on the eighth-floor roof terrace and second-floor setback. The building plan provides for a one-third expansion in the company's size. Another unusual feature: the entire second floor is devoted to employee facilities (27,000 square feet out of CIT's net total 284,000).

But even with such custom features Vice President Ittleson figures that CIT's space is reasonably economical. One explanation for his satisfaction is that the firm is not paying the high rentals of other recent New York buildings. Nor is it paying interest on a heavy building loan; the entire construction cost (about $10 million) was paid from capital surplus. In addition, CIT's management feels there are large intangible rewards in the building's fine quality and in the pride with which its employees view their new home.

In a day of mass production, CIT has invested in a custom-made palazzo. Its new headquarters is peculiar, but only in the best sense of the word.

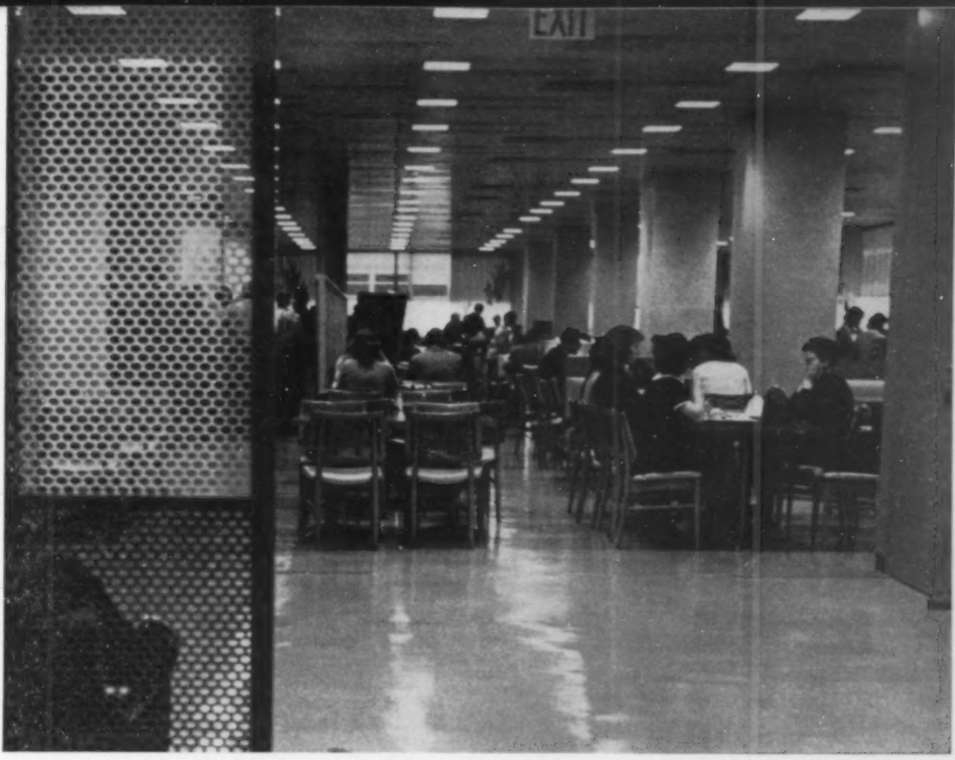
CIT
C.I.T. FINANCIAL CORPORATION

ARCHITECTS: Harrison & Abramovitz
INTERIOR DESIGNER: Eleanor Le Maire
ENGINEERS: Edwards & Hjorth (structural)
Jaros, Baum & Bolles (mechanical)
The Firm of Edward E. Ashley (electrical)
LANDSCAPE ARCHITECTS: Clark & Rapuano, John T. Ratekin
CONTRACTOR: George A. Fuller Co.

PHOTOS: ALEX LANGLEY

Ground-floor reception room of its own was one of CIT's goals when the building was in the planning stages. The lobby's curved walls of light marble and its arched ceiling provide a welcome contrast to the rectilinear precision of the exterior.

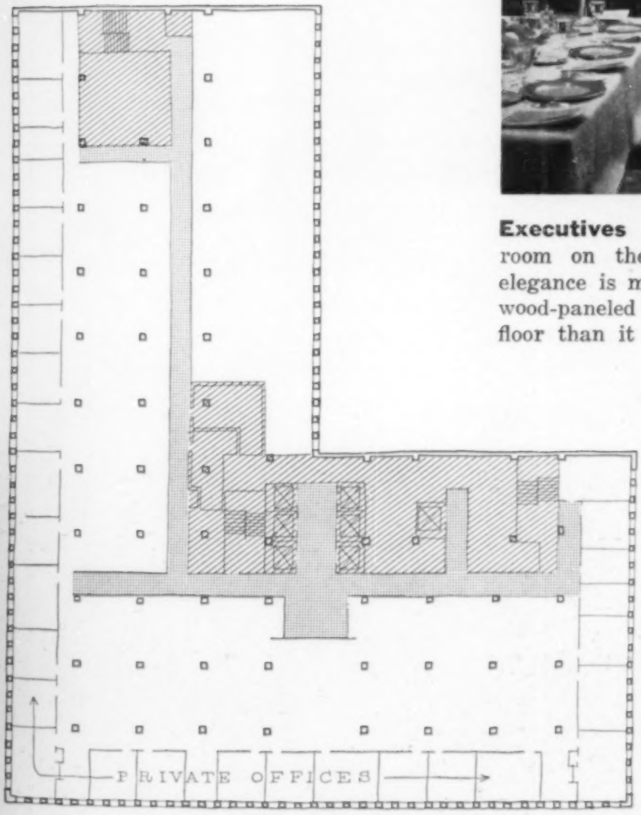
At night the building looks more like a jewelry display case than an investment house. Even the sidewalk has built-in sparklers: mica and carborundum chips set in concrete. CIT's generous employee facilities are located on the indented second floor, above the offices of the building's only tenants, New York Trust Co. and E. F. Hutton & Co.

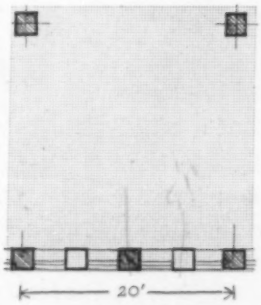


Employees eat in three shifts in the brightness of their second-floor cafeteria, operated by Schrafft's. The cafeteria can be separated from the lounge and library (foreground) by means of a floor-to-ceiling folding door (recessed at right).

Executives dine in a formal dining room on the second floor. CIT's new elegance is more obvious here and in the wood-paneled executive suites on the top floor than it is in other areas.

Perimeter offices have flush, conservatively draped walls and deep-set windows with wide sills. For easy cleaning, windows are vertically pivoted. Fluorescent lighting is recessed in the ceiling.





Typical floor plan shows how perimeter offices lap around a central bull-pen area. At either end of the L-shaped plan are stairways and employee restrooms. The sketch of an outside bay (right) shows a system of three exterior columns teamed with two interior columns. Blank wall sections, interposed between the exterior columns, reduce the glass area and thus lighten the air-conditioning load.

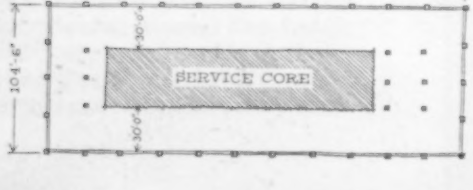
2. A tall tower for TIME Inc.

The projecting columns of Rockefeller Center's latest addition will support 47 big floors. Behind the glass façade, a new approach to office layout

By the end of the board of directors' meeting on Nov. 30, 1955, the most important decision had been made. TIME Inc. would stay in New York, would find or build itself the best possible commercial space in midtown Manhattan. Last month foundation pouring began for the building that, in the eyes of its owners, architects, and major tenant, will fulfill that objective. Scheduled for occupancy late in the autumn of next year, Rockefeller Center's new TIME & LIFE Building will rise 47 stories tall from the west bank of the Avenue of the Americas at Fiftieth Street, boasting the largest tower floors built in New York since the war.

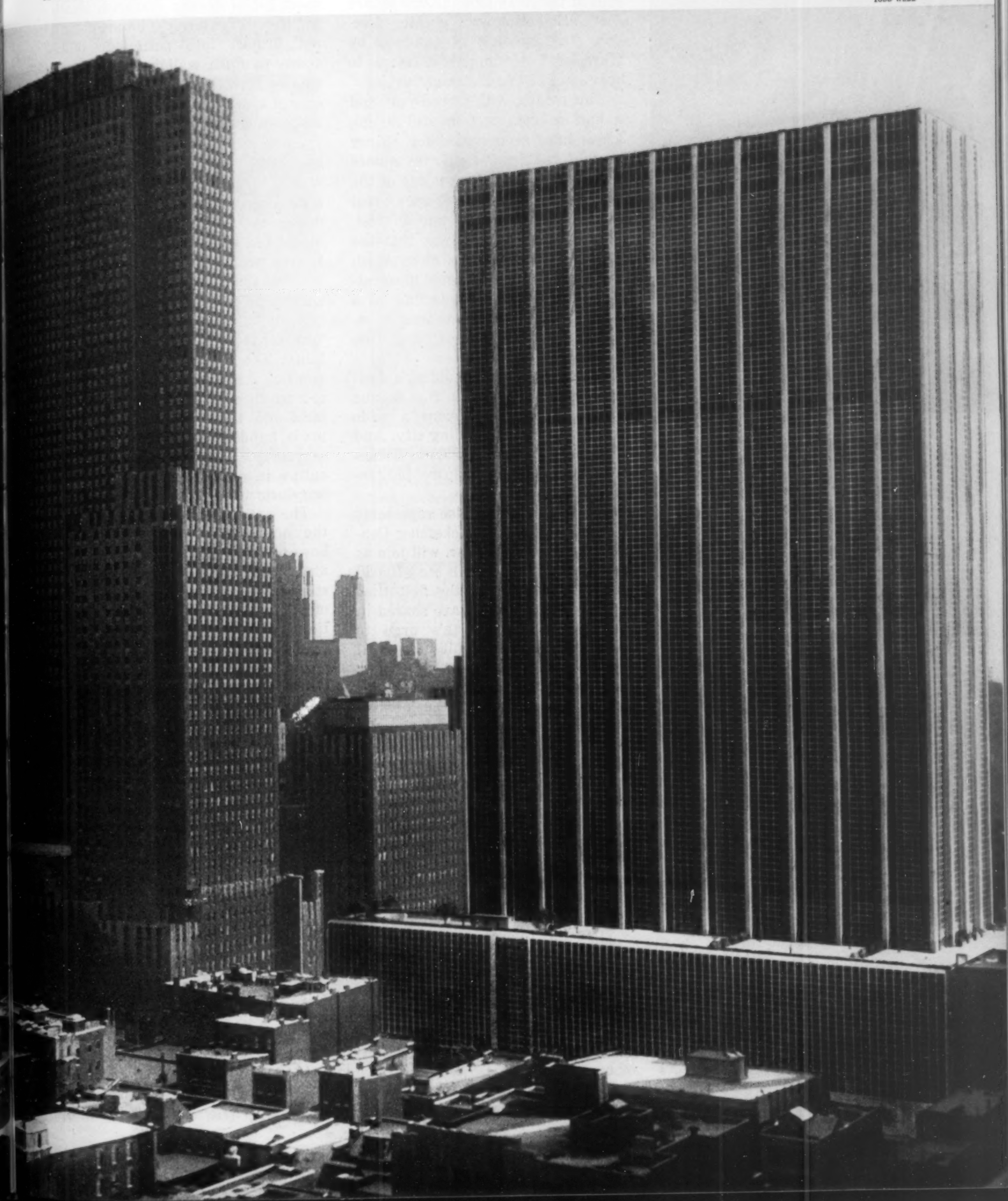
Although the projected giant has obvious origins in the shapes and attitudes of other Rockefeller Center towers, it contributes much more to the art of city-making than a careful choice of antecedents. Not only will it have vast area per floor (32,000 gross square feet) and an extraordinarily broad free span from core to exterior wall (see sketch below); the building also represents a unique idea for the design of office space. The so-called bay plan (see p. 98) eliminates one of the two conventional ring corridors found in many skyscrapers, promises to save TIME Inc., which will occupy 20 floors, a full floor of space.

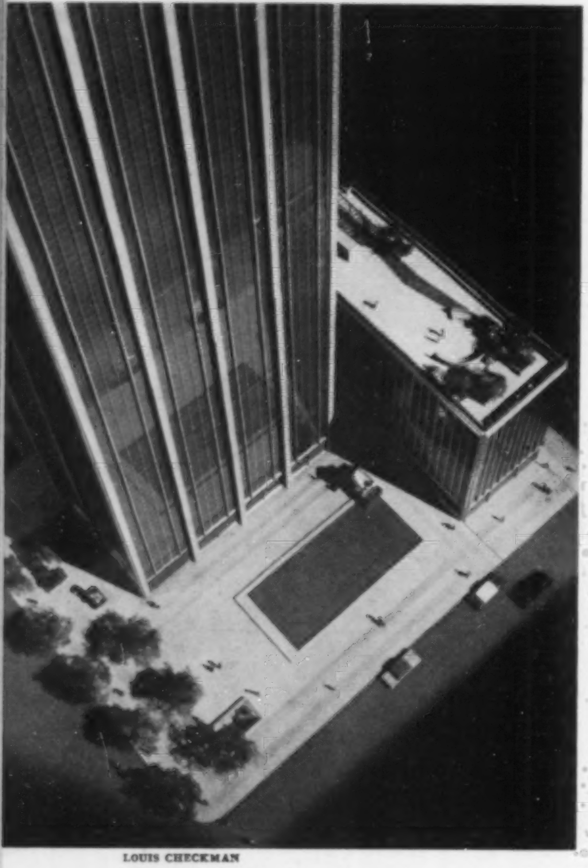
The second most important date in the development of the building was Aug. 31, 1956. It was then that Rockefeller Center bought the Roxy Theater, which shares the block with the TIME & LIFE site. New York City's zoning law demands that a building's upper floors (above 19) cover no more than 25 per cent of its site. Managers of the new TIME & LIFE Building were able to side-step this restriction



A model of the new TIME & LIFE *Building fits comfortably into a view of Rockefeller Center from the northwest*

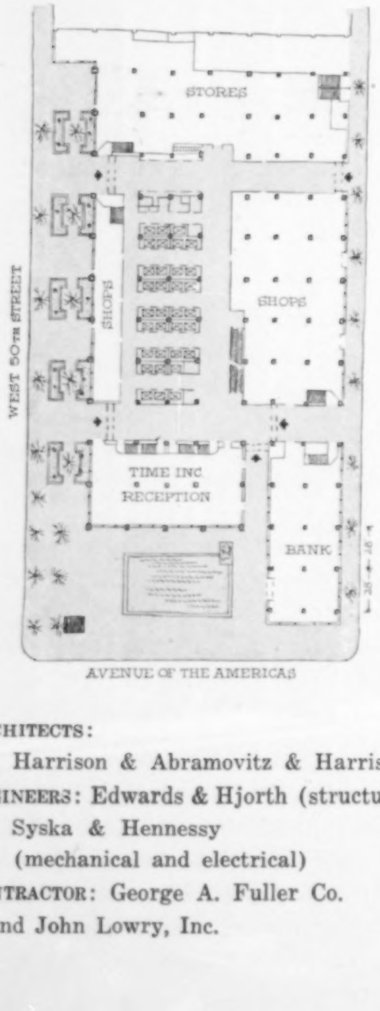
TODD WEBB





LOUIS CHECKMAN

Down to the plaza, the new Time & Life Building will plunge more than a tenth of a mile from New York's upper air. Below is a sketch of the open ground floor.



ARCHITECTS:
Harrison & Abramovitz & Harris
ENGINEERS: Edwards & Hjorth (structural)
Syska & Hennessy
(mechanical and electrical)
CONTRACTOR: George A. Fuller Co.
and John Lowry, Inc.

by expanding the "zoning envelope" through an agreement with the Roxy's purchasers. The agreement gave the Time & Life Building added tower space equal to 25 per cent of the Roxy plot (12,000 square feet). Endowed with greater freedom, the building is designed by Harrison & Abramovitz & Harris to soar some 587 feet, straight up.

This month, with a good year and a half of construction still to go, leases have been signed for 85 per cent of the total 1,525,000 square feet of rental space. Thus one of the hobgoblins of New York's real estate is permanently laid to rest. The traditional belief was that the Avenue of the Americas, along which the Sixth Avenue Elevated once rattled, could never be overcome as a psychological barrier to the westward development of high-cost buildings.

The Time & Life Building's decisive beachhead across the avenue clears the way. It opens a wide frontier for an expanding city. And it gives a forceful impetus to Rockefeller Center's open space philosophy (see page 106).

The new building also represents a new departure in Rockefeller Center economics. Time Inc. will join as a 45 per cent partner in the $70-odd million undertaking—the first time a Center tenant will have shared in equity financing. Time's urge to participate was a result of several elements. Not the least important was confidence in the Center's approach to the real estate business as observed at close range during 20 years of tenancy in the old Time & Life Building, 9 Rockefeller Plaza. Another element was Time Inc.'s desire partially to fill the gap between the prewar rent it has been paying (about $3.50 per square foot) and the estimated rent it will pay (in the neighborhood of $7 per square foot), by means of an income-yielding investment in the building.

Time Inc. thereby took on a two-hatted role: one part of its management got busy working out the details of the building enterprise with Rockefeller Center; another group began thinking about the creative challenges offered by the prospect of a new home.

To cope with the latter task, Time Inc. marshaled a squad of committees comparable to the successful, energetic building committee of Connecticut General Life Insurance Co. (Forum, Sept. '57). An early committee function was to draw up a short list of desired features. Heading the list: exterior columns should not project into perimeter office space (a flush wall had long been wanted both for appearance and for ease of shuffling interior partitions); modular design should be used.

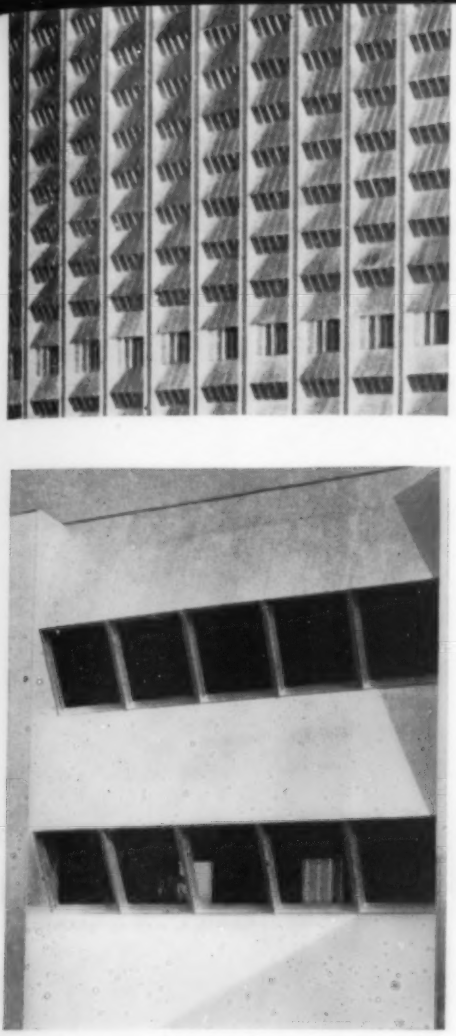
Another of the suggestions made by Time Inc. to the architects was to try an "accordion wall"; i.e., a striking façade of in-sloping windows, out-sloping spandrels (see model and mock-up, right). The objective was to get the best possible internal space. The accordion design sought to give office holders three benefits: less glare; sunshade; a "control tower" feeling of full visibility. The suggestion had a lively run but was finally retired. Against it were three drawbacks: the architects did not believe it could be made handsome; there was a loss of rentable area; some minor difficulties in drapes and air-conditioning ducts were involved.

The most important feature of the accordion wall was retained, however: the exterior structural columns (see sketch at right). Limestone faced, strongly vertical, they offer an opportunity for visual tie-in with the rest of Rockefeller Center. They will also leave perimeter offices free of the usual, elbow-nudging intrusions.

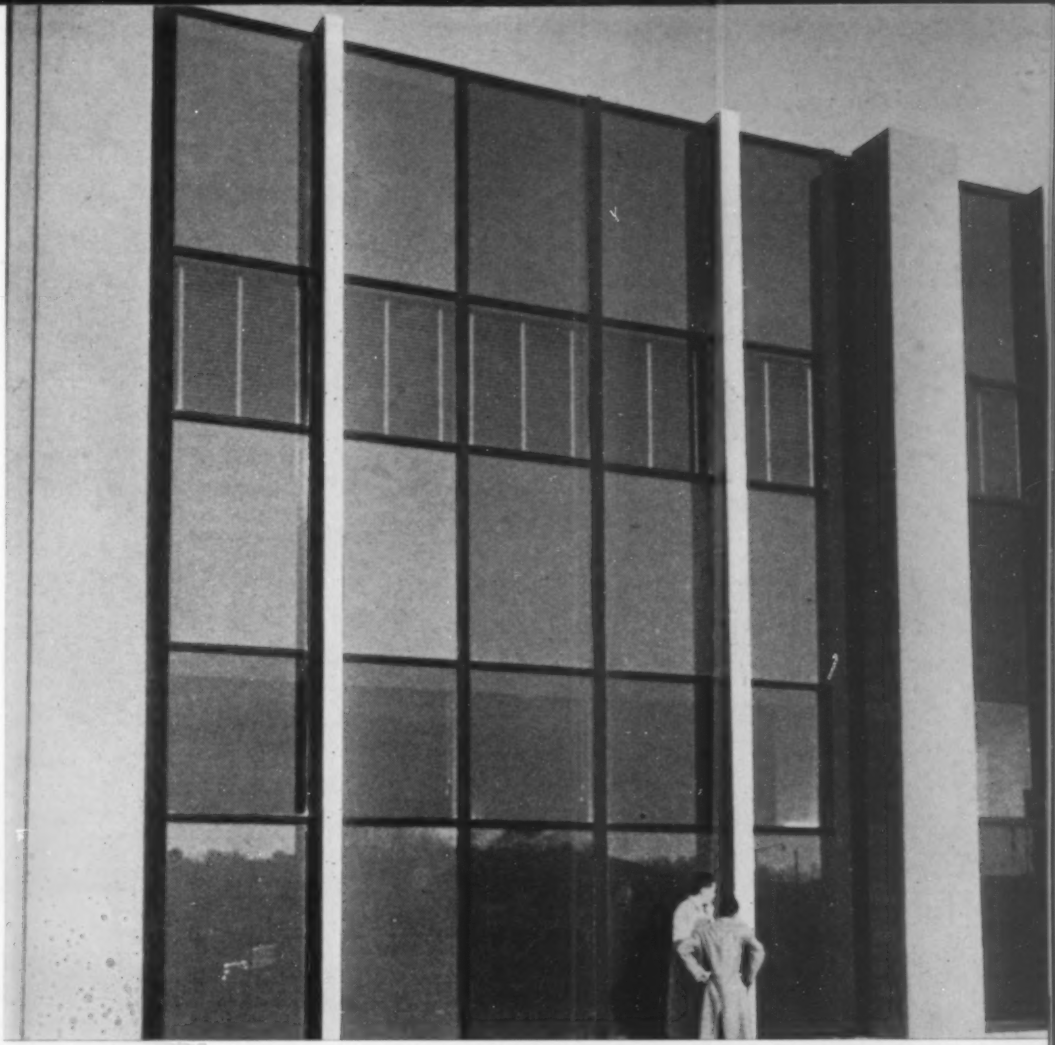
Tower of glass

Between the columns is a distinctive aluminum and glass grid; in every 28 feet there will be five 4-foot 8-inch window modules and one blank column module. To cut down the air-conditioning load, the windows were originally drawn small and square. But, for esthetic reasons, the sills were lowered to desk height (2 feet 6 inches), which also made it possible to sheathe the spandrels in single sheets of glass. The clear glass spandrels are backed by gray aluminum mesh, intended to look like the equally clear glass of the windows.

Secondary vertical features are the twin air-conditioning risers in each bay (see sketch). These service the peripheral air-conditioning

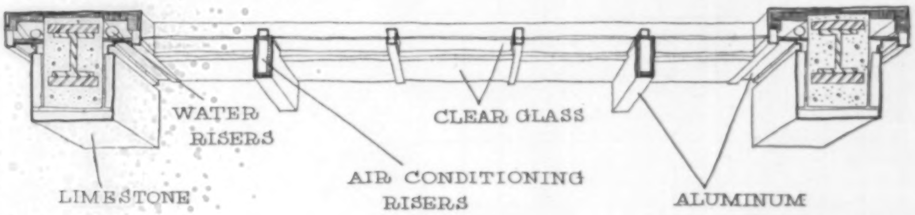


Early experiment: The accordion wall was considered at one point in the façade's development. The lower view is a full-scale mock-up of the model at top. It proved to be uneconomical.



Latest version of the façade is shown in this mock-up. Clear glass windows and spandrels will be framed in an aluminum grid, vertically striped by slim air-risers and substantial, limestone-faced columns.

The horizontal wall section shows how the 28-foot bay breaks down into six 4-foot 8-inch lateral modules, stripped clean of structural clutter on the inside and clearly expressed on the outside.



system, while a core system handles the center of the building.

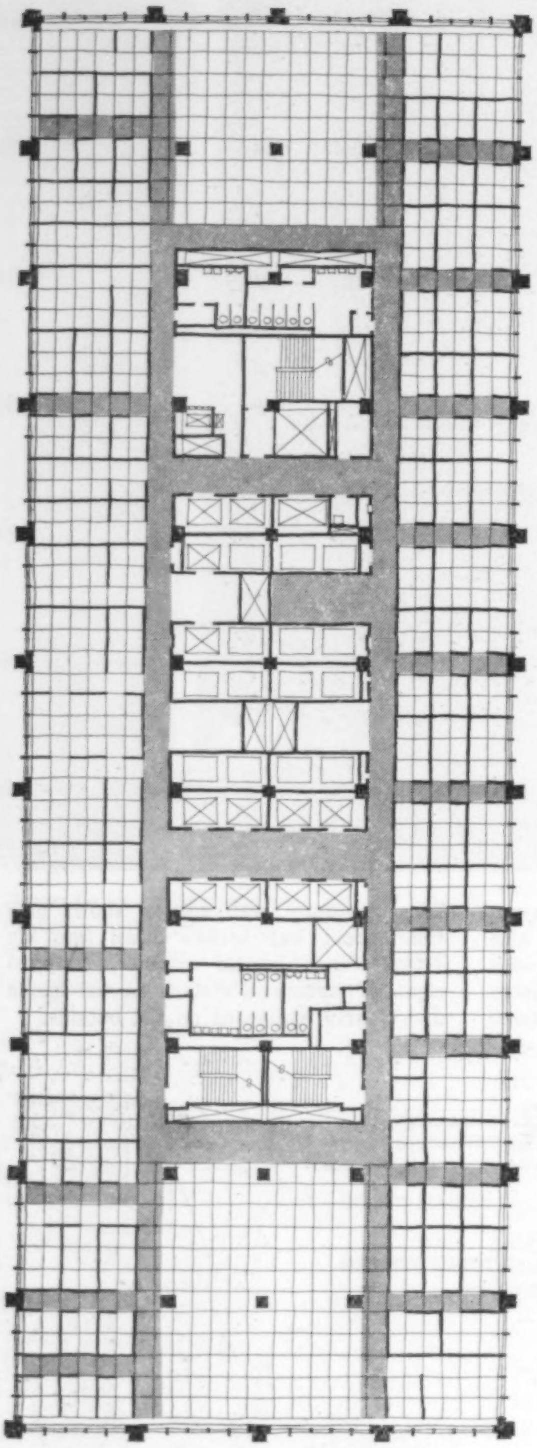
The eight vertical air-conditioning zones which run up through the building will be broken down into horizontal zones, floor by floor. In the space to be occupied by TIME Inc. (floors 8, 9, 16 through 34), each floor-zone may be controlled by individual thermostats. Since the company's departments on some floors work odd hours and week ends, this floor control system will reduce air-conditioning operating costs.

Even without such special treatment, the TIME Inc. floors would have a different look from the floors occupied by other tenants. The magazine business puts unusual strains on traditional office layouts. It requires maximum flexibility, excellent interdepartmental communication, and a high proportion of private office space for people engaged in creative work.

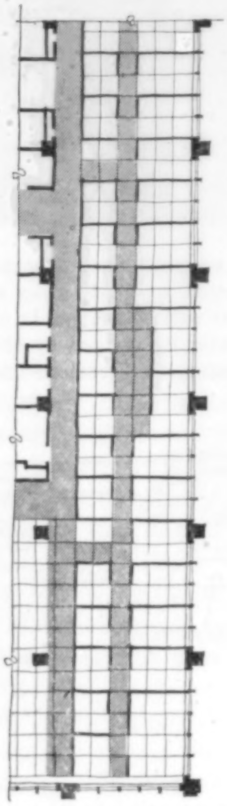
TIME Inc.'s interior designers, Designs for Business, learned of these needs during the course of a collaborative experiment carried out on the 11th floor of the old TIME & LIFE Building (see page 99). Designs for Business provided a "space module" 4 feet 8 inches by 4 feet. Six of these modules plus a generous corridor fit in the 30 feet between the building's service core and its exterior wall.

Designs for Business also worked out a unique layout (next page, top), the "bay system." It is designed to save TIME Inc. office and corridor space equal to an entire floor. It will be of great interest to all space-hungry companies as they move into towers of the future.

For the result of these many experiments, TIME Inc. will pay no more than going rates. By knowing what it wanted, the company has been able to get space and facilities rare at any price.



BAY PLAN CORRIDORS

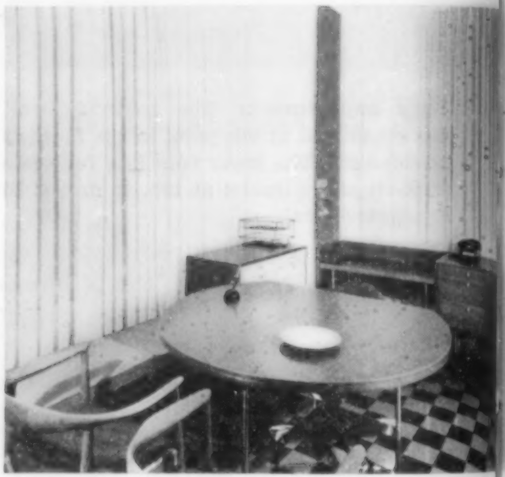


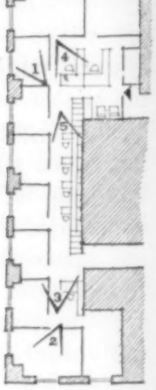
CONVENTIONAL CORRIDORS

1

PHOTOS: (ABOVE) J. ALEX LANGLEY; (BELOW) BEN

2

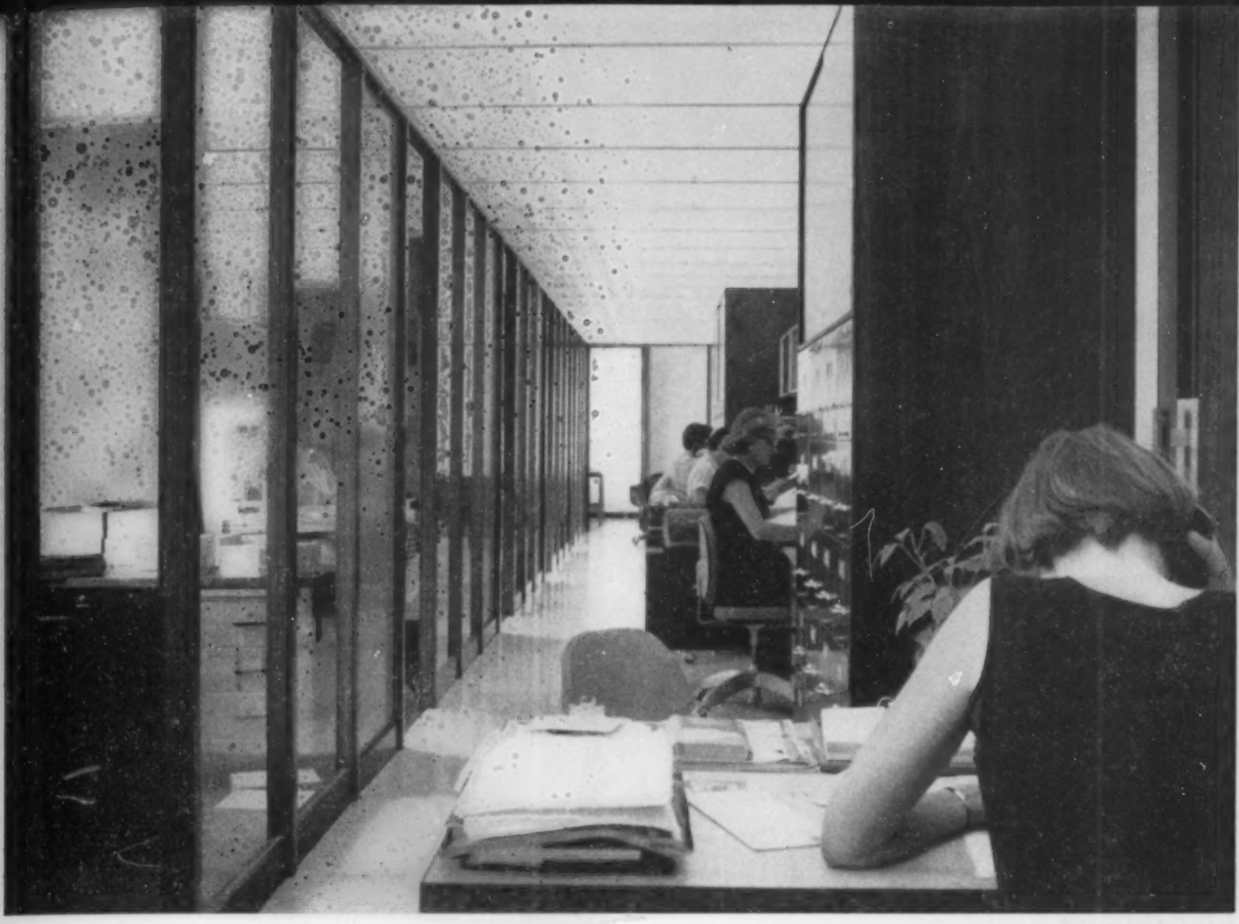




An innovation in corridor layout

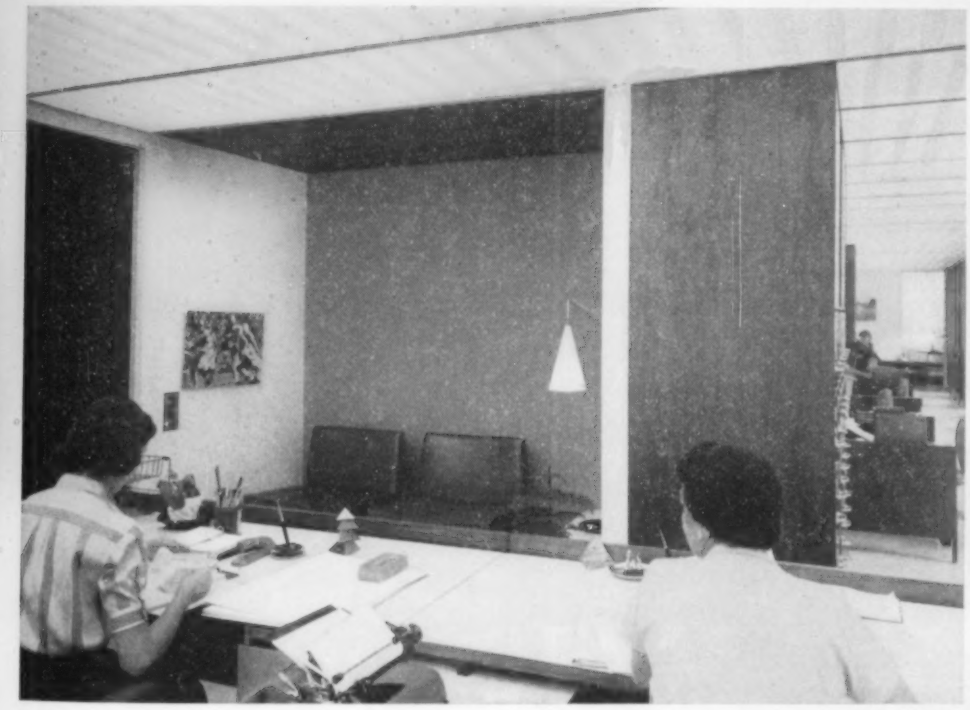
The "bay plan" devised by TIME Inc. and Designs for Business eliminates one of two conventional hallways. Standard procedure would be to ring the elevator banks and service areas with one public corridor and to run another corridor through the middle of the office areas (see sketch at right). The bay plan leaves out the latter. In its place, and to provide access from the interior ring to the exterior wall, short, transverse passages have been drawn outward from the center. Off these passages (which end at either a window or a column module) open the individual offices in departmental clusters.

The structural advantage of the bay plan is its flexibility, made possible by its strict adherence to the 4-foot by 4-foot 8-inch module. It will permit even greater diversity of floor layout than shown in the plan above; it will also permit flexibility after the floors are completed, for every panel is easily demountable, readily interchangeable. Overnight an editor's office (12 modules) could be subdivided into space for two writers (of six modules each); a tight grouping of writers and researchers (like that shown on the right side of the bay corridor plan) might be converted into a more varied area (left side).



3

PHOTOS: (BELOW) BEN SCHNALL; (OTHERS) J. ALEX LANGLEY



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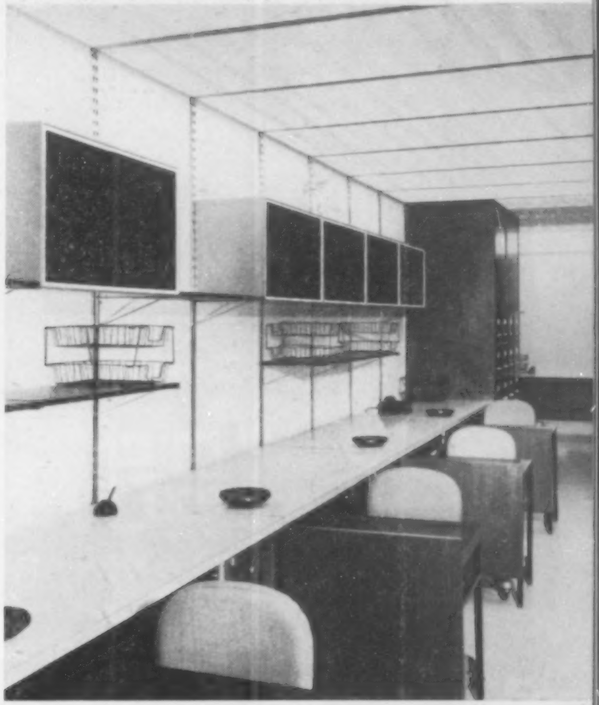


5

An experiment in interior design

On a trial basis 1,600 square feet of floor area and 16 TIME Incers were made available to Designs for Business on the 11th floor of the present TIME & LIFE Building. But, unfortunately, the space could not be evenly divided by the module Designs for Business wanted to use in the new TIME & LIFE Building (4 feet by 4 feet 8 inches). Settling on a 2-foot 8-inch module for the experiment, the designers got down to the business of watching TIME at work. Among the space discoveries made: TIME Incers generally require neither two-pedestaled desks nor file drawers in their immediate areas (centralized files will do); there is a great need for truly private offices that will nevertheless not block light from the interior; although conference suites are necessary for executive offices, they can be combined with working space.

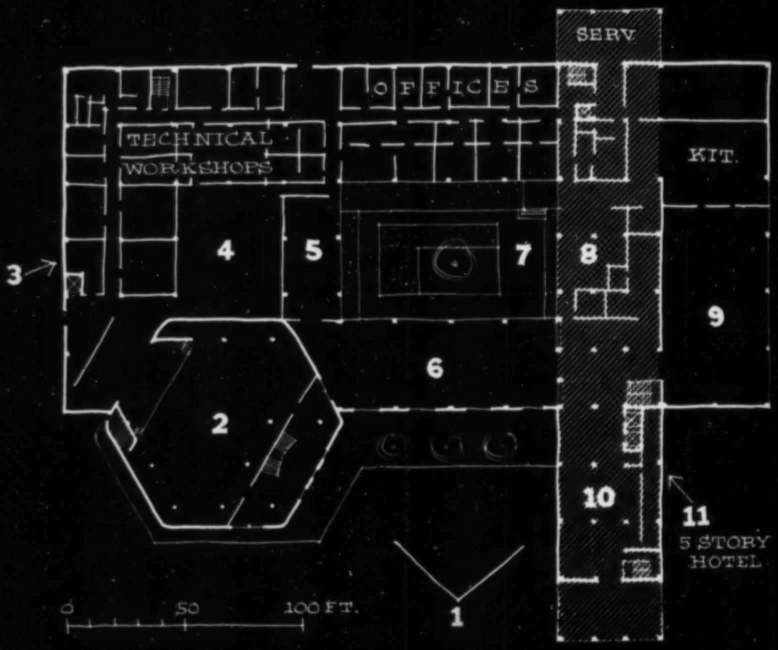
These findings were designed into the test offices, shown here, in the following ways: a glass-walled office is set up for semiprivate use **(1)**; an executive office doubles as a conference room **(2)**; an interior office corridor is well-lighted and strikingly module-conscious **(3)**; a double secretarial desk has central filing space beyond **(4)**; and working space is freed of filing clutter by putting individual cabinets and drawers in the wall **(5)**.

5. A glass-fronted reading room invites browsing.

6. On their way between working and living wings, group members pass the exhibits in the broad main lounge.

7. Between meetings, debate continues in the pleasant central courtyard . . .

4. The Center's TV workshop makes conference material into plays, sends through the building on closed circuit.



SERV.
OFFICES
TECHNICAL WORKSHOPS
KIT.
3
4
5
7
8
9
6
2
10
11
5 STORY HOTEL
0
50
100 FT.
1

3. Upstairs, smaller seminars get down to business, with no windows to open, close or gaze out of during sessions.

2. In a hexagonal auditorium, full groups come together for meetings, general-interest programs, dramatizations.

1. On curving front walks, conferees can stroll, chat, see exhibits.

8. . . . in the "sidewalk café" snack bar that overlooks it . . .

9. . . . in a white-linen dining room, convertible for banquets . . .

10. . . . and in the hotel lobby, across from the front desk.

11. Even in studio bedrooms, upstairs, talk and TV are provided for.

PHOTOS: ALEXANDRE GEORGES

A modern conference center at the University of Georgia boasts an auditorium, conference hall, art gallery, restaurant, hotel—and even a TV station

School for grownups

The boom in adult education will involve over 35 million Americans this year. They will participate in everything from farm extension courses to church discussion groups. Few of the participants, however, will have a more dramatic chance to bone up on their changing worlds than the professional and business groups that pass through the University of Georgia's new $3 million Center for Continuing Education at Athens, Ga.

This big red-brick, white-trimmed building, smartly dipping its architectural colors to an older, Georgian-style campus, is actually the first building in the U.S. to combine all the modern facilities needed for resident adult conferences with the latest equipment and techniques of teaching, and to place them next to the resources of a major university, whose departmental faculties can aid conferees in their special fields.*

Armed with an array of training and communications aids (photos left) and the specialists to operate them, the Center's staff can help almost any local, regional, or national group with a serious educational purpose to organize a conference or short course that will stimulate a maximum exchange of ideas, with a minimum of time spent away from participants' regular jobs.

Since the Center opened last January, over 16,000 people have taken part in programs ranging in length from one day to six weeks; among them have been associations of teachers, ministers, lawyers, newspapermen, judges, city managers, industrialists, bankers, retailers, restaurateurs, accountants, farmers, foresters, dramatists, small business owners, and housewives. Tuition fees range from $5 per student per week to $125, depending on the services rendered. When asked, the staff helps with research, lines up speakers, mails out preconference and postconference homework, prepares printed, filmed, taped, or TV material, will take orders for special exhibits—even flower arrangements—and will advise conference leaders on which jokes to use and which to forget.

When the Center's own highpower TV channel goes on the air this spring, beaming programs toward Atlanta and a potential audience of 1½ million, students will be able to supplement their conference learning by video at home. To complement the highly specialized courses given to the various industry and professional groups, and to give them a common cord of learning and conversation, Center Director Hugh Masters is also developing broad-interest TV programs on the "Creative Aspects of Man," "Rights of the Individual," and seasonal programs on Christmas and Easter around the world. Also in the works: "How to Spend Your Vacation."

On the following pages are some closer looks at the center's unusual facilities.

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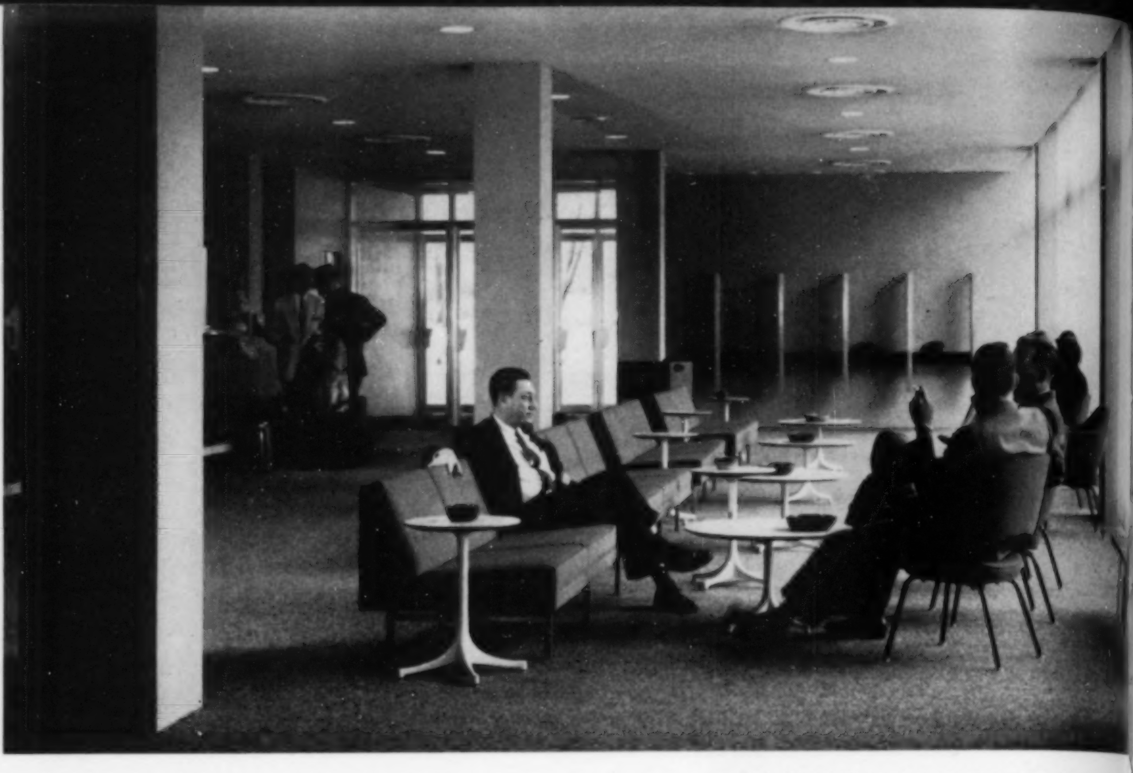
* The Kellogg Center at Michigan State actually predates Georgia (1951), has a larger hotel but smaller conference and audiovisual facilities. Both were largely financed by grants from the W. K. Kellogg Foundation of Battle Creek, Mich.



Hotel lobby has its front desk just inside the entrance, its lounge placed out of traffic overlooking the exhibit garden. Here conference guests relax and talk shop.

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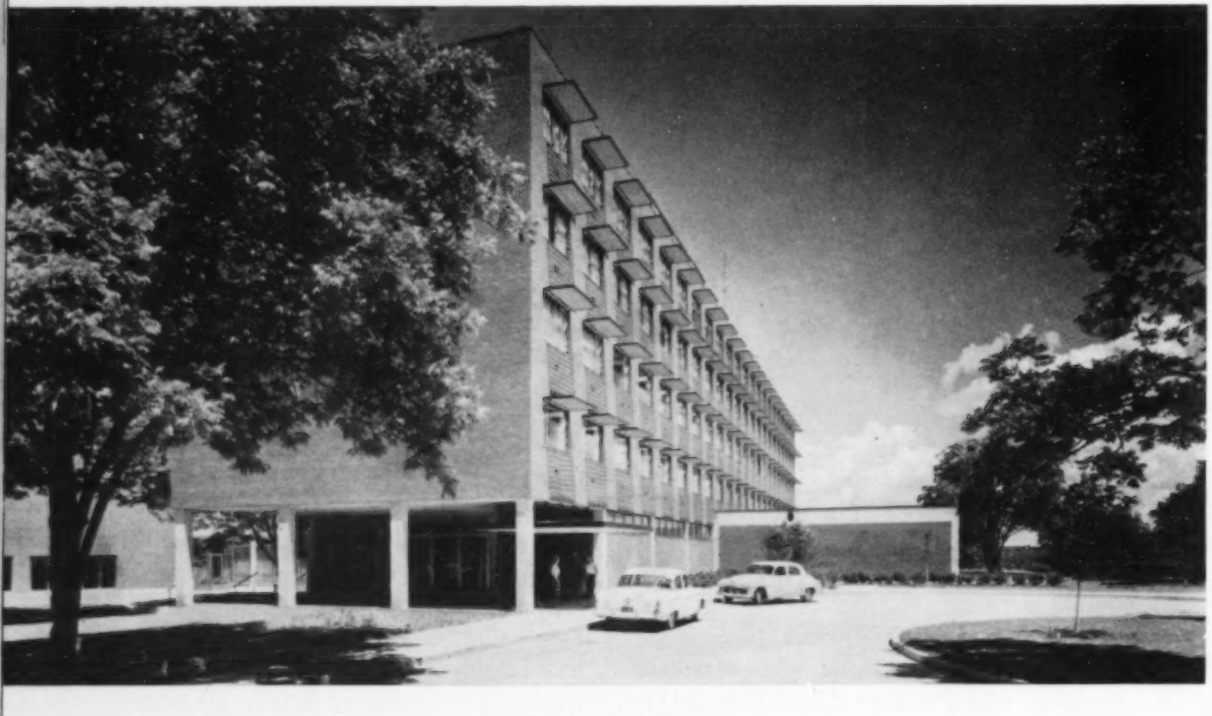
Reading room, stocked with current conference literature, looks out to the central court, which is pleasantly landscaped as a sitting area around an old pecan tree.



Hotel bedrooms rise four floors above the entrance, shielded from the south sun by egg-crate canopies of anodized aluminum. Architects Stevens & Wilkinson report a low cost of $8,200 per room.

GEORGIA CENTER FOR CONTINUING EDUCATION, Athens, Ga.
OWNER: State Board of Regents, University System of Georgia
ARCHITECTS & ENGINEERS: Stevens & Wilkinson; Louis Sarvis, consulting architect
LANDSCAPE ARCHITECTS: Thomas D. Church & Assoc.; Edward L. Daugherty
STRUCTURAL ENGINEERS: Morris, Boehmig & Tindel
INTERIORS: Stevens & Wilkinson; George Nelson & Co.
GENERAL CONTRACTOR: de Give, Dunham & O'Neill, Inc.

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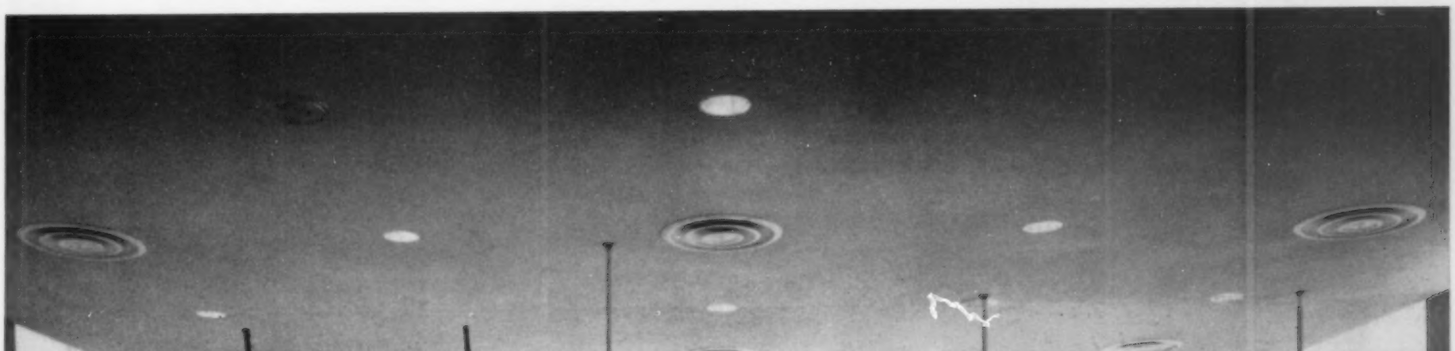
Exhibit lounge can be all exhibit, all lounge, or a combination, as it is here for an art directors' show. Display fixtures by Edison-Price; other interiors by George Nelson.


MIAMI
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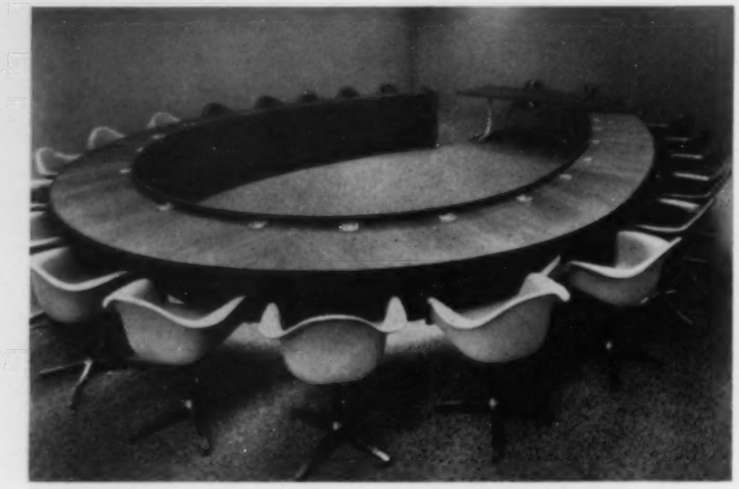
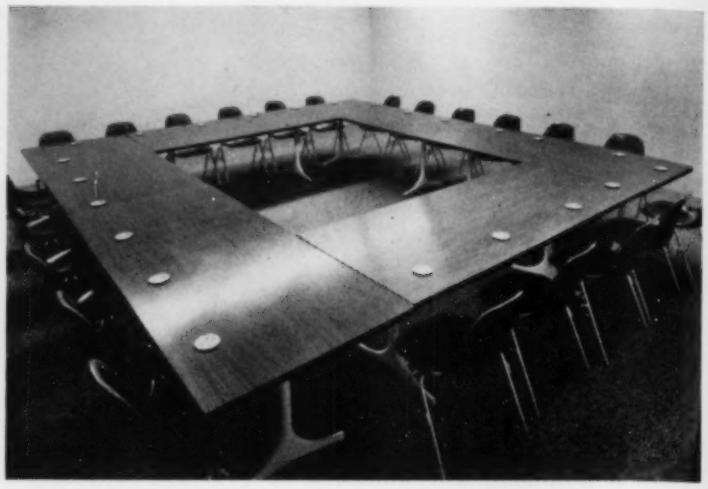
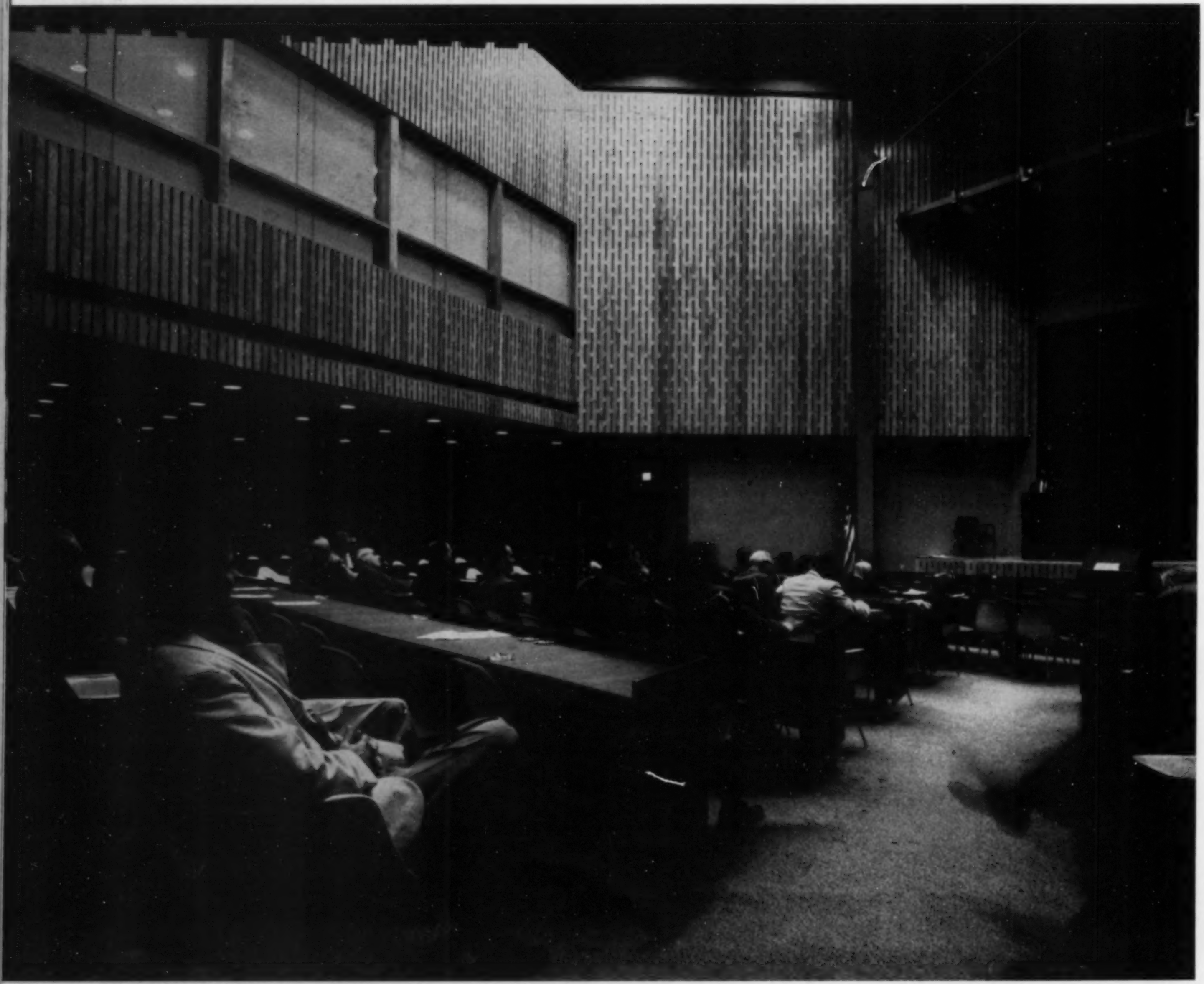


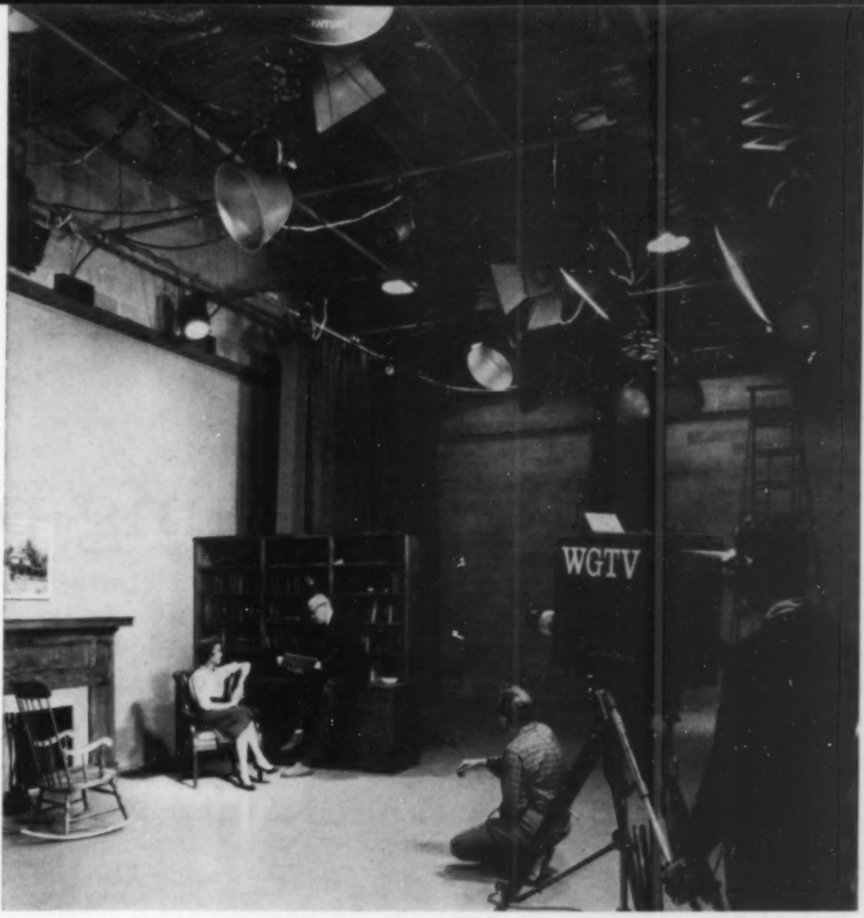
Horseshoe tables in some meeting rooms provide elbow room, equal views of speakers, access to open space at center.



Pedestal tables in other meeting rooms can be arranged in several combinations, depending on requirements.

Auditorium, patterned after the U. N. General Assembly, seats 380 plus 64 in the glassed-in balcony conference rooms.





TV studio has dramatized everything from stockholders' reports to canine surgery on a closed circuit.

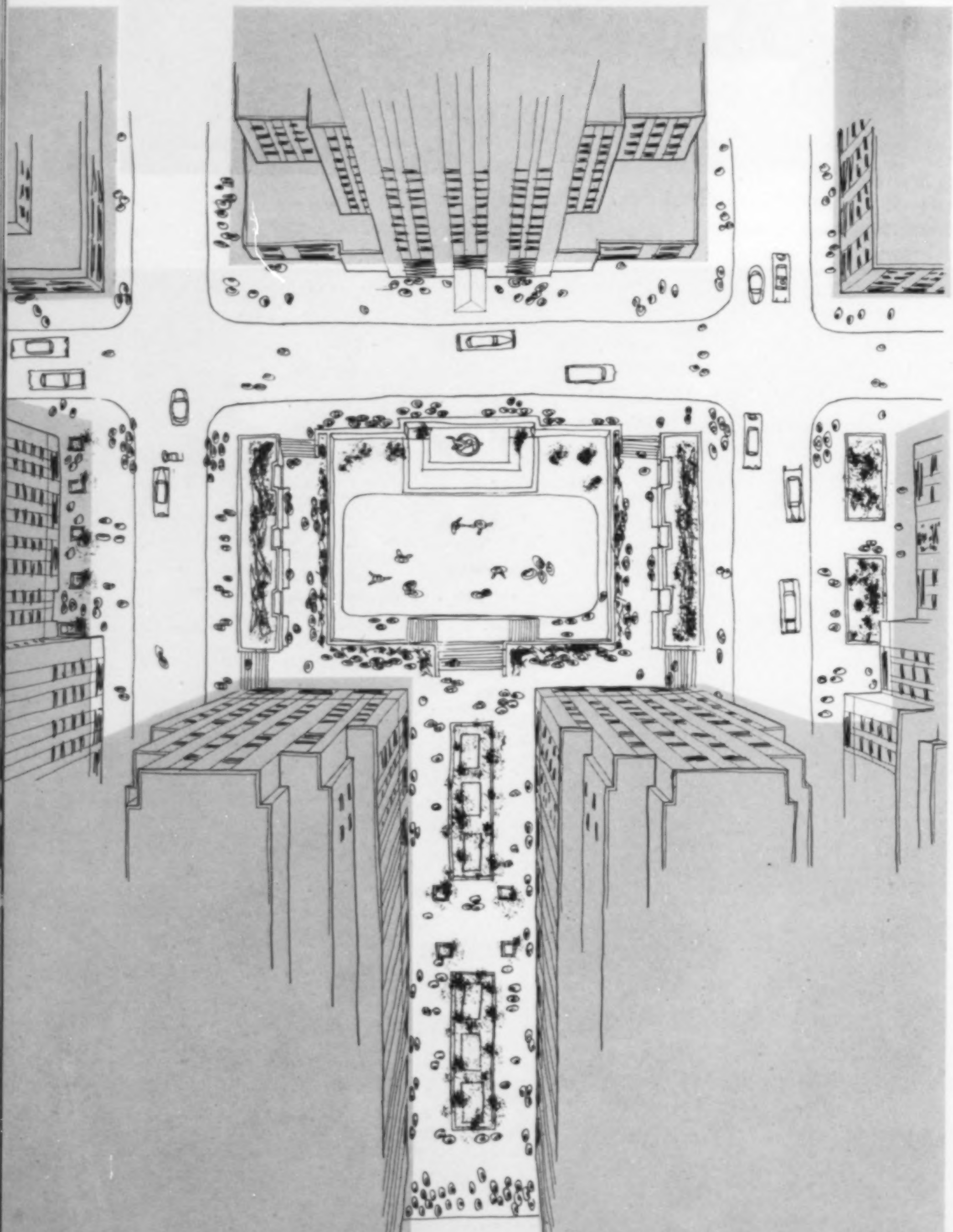
Exhibit garden is an extension of the display lounge; marble louvers above give conferences privacy, north light.

It takes a long time for the esthetic awards of landscaping and open space to show up in profits. Needed: some city help to speed up the process

by FRANK FOGARTY

The earning power of plazas

Manhattan's Rockefeller Center, 26 years old, is still the most ambitious plaza project



One of the more appealing ideas to spring up in the twenties was that the stark skyscraper tower could be improved economically as well as esthetically by having an amount of greenery and air around it. With a little bit of open space, the idea ran, higher rentals would result, and a bit more profit could be had. But is it really true that a plaza or a terrace is a financial asset? A FORUM survey seems to show that, on the contrary, although open space will enhance the prosperity of a business district, there is no guarantee that it will immediately enhance the income of the owner who supplies it. Light and air can be a lever on profits in the long run. But, short term, they can also be a squeeze on them. The great benefits which open space can bring to the central city will thus probably never be fully realized until the city itself does something tangible in terms of incentives to get them.

Consider, for example, the rental and earning records of the four principal office projects that have devoted a substantial amount of their land area to open space, and compare their earnings with the real estate "par" of 10 to 12 per cent on invested capital before mortgage costs and federal taxes.

▶ Of the two biggest postwar office developments to use open space in their plans—Gateway Center in Pittsburgh and Penn Center in Philadelphia—one appears to be a better-than-average moneymaker, the other only a so-so investment. Penn Center's office space, though still only partly finished, seems to be returning, about as much as a speculative builder could hope for. Against this, Gateway, despite near

100 per cent occupancy, is not bringing back much more than a bare-bones 4 per cent on the cost of its three office towers and their land.

- The oldest and by far the best designed of the plaza-equipped projects, Manhattan's Rockefeller Center, is today completely filled, has an awesome waiting list of tenant applicants, and is an unqualified civic success. Still, its indicated net return is far from spectacular; only a little more than 6 per cent.
- Denver's Mile High Center, which has been open since 1955, has yet to fill all its floors. It is not showing any extraordinary profits, but it is making out at least as well with its open space as the more conventional buildings around it.

Admittedly, this evidence is skimpy. It is confined mainly to a sellers' market and, of necessity, it is limited to the handful of projects which have had some competitive experience with open space (Lever House in New York, for instance, which does have a plaza, is not included because it is owner-occupied; the Seagram, Chase Manhattan, and new TIME & LIFE buildings (p. 94), which are the only other notable contemporary buildings to use open space competitively, are not yet finished). Yet despite these limitations, and the fact that there is no accounting for some of the more intangible rewards of open space such as advertising and prestige value, the evidence does show at least two things clearly: 1) open space is unlikely to lead to any unusual profits, at least in the short run; 2) the relationship between space and income is highly complex and depends to a great extent on the location and time of construction of the individual building.

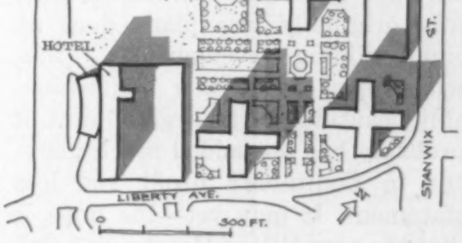
This, of course, hardly squares with what has been a popular theory about the profits of space. For obvious reasons—the esthetic delights of greenery, the relief it can bring to congestion and monotony, and sheer love of designing the monumental—many architects have long felt an almost personal stake in the issue of open space for downtown. To bolster the idea that the skyscraper is, as Le Corbusier said, "a wonderful instrument of concentration to be placed in the midst of vast open space," there has gradually emerged what might loosely be called the economic theory of open space. This holds that by leaving a certain amount of a building site to landscaping, the building will be able to command higher rents than its competitors, and that these rents will be sufficiently high to result in a greater return on the investment, even after allowing for the loss of revenue from the unoccupied space and the costs of taxes and maintenance on it. Properly defined and limited to specific cases, the theory does have some validity. But it cannot be applied across the board.

In its appraisal of open space projects, FORUM has not been able to examine the operating statements of the buildings it has reported on. Thus the figures shown here represent a synthesis of data supplied by owner-managers, with estimates of realtors and brokers, other building managers, and in some cases former employees of the project owners. If the figures are not exact, they are nevertheless thought to be very close.

Gateway Center

No project has come so close to Le Corbusier's idea of towers in a park as Pittsburgh's Gateway Center. The three office buildings which the Equitable Life Assurance Society completed in 1952 stand amid nine acres of trees, lawns, shaded walks and fountains, and the buildings themselves take up only about one-fourth of the site. "America's finest business address," the center's publicists called it, and from the start it was a showpiece, not only for Equitable, but for the whole of Pittsburgh's redeveloped Point area at the confluence of the Monongahela and Allegheny Rivers. (Gateway, for which the insurance company originally bought 23 acres and now holds 13½, accounts for about 40 per cent of the land in the still-unfinished reconstruction area of the Point.) If Gateway never hit its potential for good design—humdrum architecture and an off-center site badly isolated by traffic made it fall short—it nevertheless did achieve a certain shininess and luxury and, on the whole, a not unpleasant air.

The first tenants who moved into Gateway's 939,218 square feet of rentable air-conditioned space in April, 1952 paid an average price of $4.77 per square foot annually, not including partitioning, carpets, or special lighting. This was 25¢ to 50¢ more than the top rate in Pittsburgh's older non-air-conditioned buildings, but still a bargain when compared with the peak $6 being asked by the then new and air-conditioned Alcoa building in the heart of Pittsburgh. Off to a fair start, Gateway was 42 per cent rented before it opened, 75 per cent full by the end of 1953, and 85 per cent full at the close of 1955. Last month its



Gateway Center in Pittsburgh, the first section of which is shown above, sets aside nine acres for three cruciform towers and garage. Building at upper left is Hilton Hotel, now abuilding.

occupancy topped 96 per cent.

Equitable says that Gateway's three office towers and their land, the so-called Parcel A of the center, have been in the black since the close of 1954. Just how far in the black is one question Equitable prefers to duck, however, and to answer it one has to turn to some estimates and assumptions.

Taking last year's rental rolls, Equitable's gross income from Parcel A probably amounted to about \$4.5 million, or roughly \$5 per square foot of rentable area (starting in 1955, the rent level moved up to \$5.50). Against this, operating costs were about \$1.75 a square foot which included 1¢ or so for upkeep of the grounds. Adding real estate taxes, which are high (in Pittsburgh land is taxed at twice the rate that applies to buildings), depreciation, and a service charge which Equitable is still paying the Urban Redevelopment Authority for assembling and clearing the Gateway site, total costs add up to about \$3 million. Subtracted from revenue, this would mean a net of about \$1.5 million a year before federal income taxes.

On the assumption that Equitable has about \$35 million tied up in Parcel A, a profit of this size figures out to about a 4 per cent return on the capital investment. This is low by real-estate standards, and it probably explains why the company has delayed until now on a fourth office tower and why it has sold off sites for two other buildings (Gateway originally was planned as an eight-building development). Thus, while open space has unquestionably beautified Pittsburgh's Point, it probably has not added much glamour to Equitable's profit and loss statement. It may yet—the hope is that the new Hilton Hotel now being built in the center will increase ground traffic and raise the rental take from stores— but that remains to be seen.

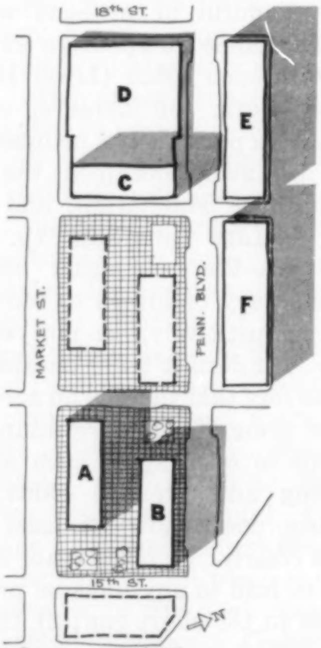
Penn Center

Compared with Gateway, Philadelphia's Penn Center, which is still under contruction has had only a brief experience with open space. Of its two completed office buildings —one owned by Uris Brothers, the other by McCloskey & Co.—only the Uris tower has been open long enough for any meaningful results to show. What the tower reveals is perhaps no more than a clue, but it is a significant clue, particularly in the light of Gateway's experience.

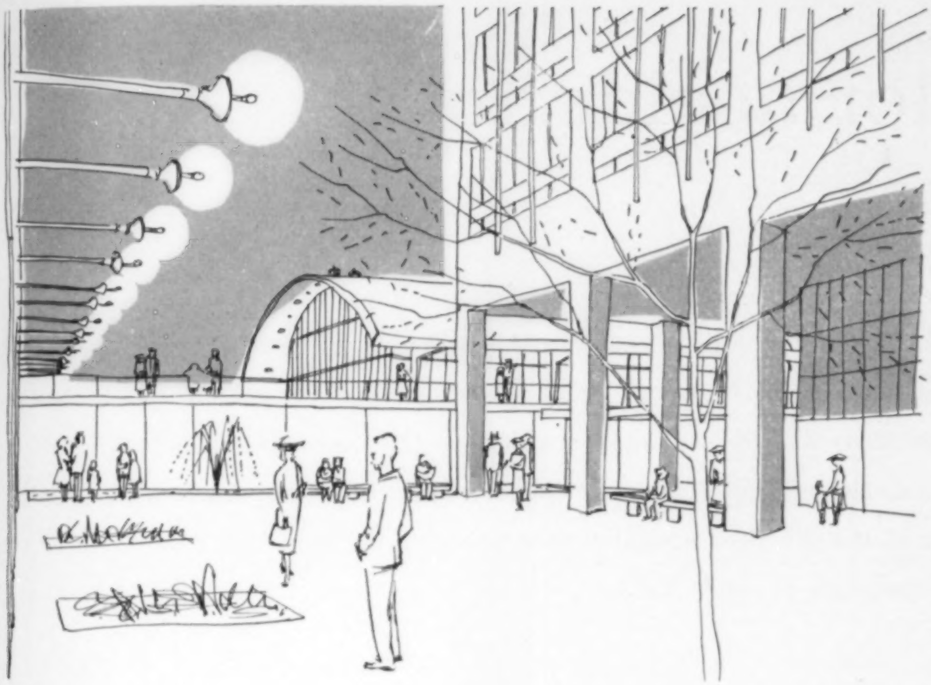
Penn Center, or more properly the Pennsylvania Railroad which owned the land, did three things which Gateway did not do: 1) it offered the building sites for lease to builders with sale conditional on approval of plans; 2) it reserved only a limited amount of open space, about one-third of the project (the physical layout is actually a compromise between the schemes of City Planning Director Edmund Bacon and Real Estate Adviser Robert W. Dowling, who also helped plan Gateway); and 3) it picked for itself a near ideal location. Carved out of the Pennsy's old Chinese Wall, which once carried suburban trains into Broad Street Station, the center sits hard by City Hall, only a few blocks from the heart of the commercial district and directly in the path of downtown's westward expansion. Most of its 23 acres are in a strip of three rectangular blocks (see plan, right); the remainder of the center, which is adjacent, includes the site of the new Sheraton Hotel and the 17-year-old Suburban Station building, but is still mostly undeveloped. Of the main area, two-thirds is to be covered eventually with buildings—an underground concourse is also involved—and the open space is concentrated in esplanades and courts in the first two blocks of the rectangle.

Architecturally, Penn Center is pretty much a lost opportunity; the magnetism it might have achieved through good design is today sadly lacking. Yet business has been attracted to it, to its good location, its air of prestige; and from the first, its office towers have made money. The 20-story Uris building, completed in the spring of 1955, was 100 per cent occupied within six months. The McCloskey building, just finished, is 90 per cent rented (more than 50 per cent of the space is taken up by the Pennsylvania Railroad). Meanwhile Uris has been going ahead on a second tower, due to be ready by the end of 1959, and commitments in hand account for 25 per cent of the space.

A reasonable estimate is that the first Uris tower is returning somewhere between 10 and 12 per cent,



Penn Center in Philadelphia concentrates its open space in two blocks. Buildings A and B are Uris office towers; C and D, McCloskey office building and bus terminal–garage; E, Sheraton Hotel; F, Suburban Station Building. Sites in middle block are still vacant.



Mile High Center in Denver has both upper and lower plazas, three times as much open space as covered area.

after depreciation, on its cost and before any financing charges. This is predicated on the fact that rentals have been as high as any in Philadelphia, an average of about $5 a square foot; that operating costs have probably come to no more than $1.65, including taxes; and that considering the Uris method of operation, the firm would not be going ahead on a second building if the first were not bringing in close to a maximum return. This is limited evidence, to be sure, and a better test of Penn Center will appear when it is known how the McCloskey building makes out and how ground-lease terms run on the two still-vacant sites. But for the moment, the center's office space seems to be feeling no pinch at all.

Mile High Center

When Denver's Mile High Center opened in 1955, FORUM described it as "something new in downtown architecture: a speculative office building . . . that looks as if it had been built for a first-class institution." Pulled back from the street on a two-acre corner lot, the center's 23-story tower was set among fountain-pools and plazas, and all of its three buildings—two low-lying roofs shelter a bank and a transportation center—took up only about 25 per cent of the site. Denverites called the tower the "New York building," because it was built by New Yorkers (main owners: Webb & Knapp, Inc. and George A. Fuller & Co.; architect: I. M. Pei) and asked rents of $5.50 to $6 a square foot which were definitely New Yorkish in what was traditionally a $3.50 city.

Mile High's space hit the market at a time when three other new buildings were scrambling for tenants, and when Denver as a whole could point to a 60 per cent increase in its Class I office capacity. Though the center's rents were not greatly out of balance (some of the other new buildings were getting $5 a sq. ft.), they were the highest in town, and Mile High was quoting them for a less-than-ideal location. Not surprisingly takers lined up slowly: in the summer of 1955, the center was 55 to 60 per cent occupied; two years later occupancy had moved up to only 78 per cent, and by the end of last year, it was still 15% vacant. Yet with all this, Mile High has made money, and Denver realtors today reluctantly concede that "Webb & Knapp has pulled it off." The Center is now returning about 4½ per cent on its $13 million cost, after depreciation and finance charges, and this amounts to a respectable 8 per cent before finance charges. While the center has not always been able to get the rents it asked—the average price for its occupied space is probably not much more than $5—it nevertheless has done as well as some of its more conventional neighbors which are built on every square inch that the zoning law allows.

Rockefeller Center

Were it not for its birth date, Rockefeller Center would probably rank as one of the most profitable real estate ventures of this generation. But because it was born in the depression, when it took the big price cut and big lease concession to get tenants, the Center is not a great moneymaker today, though it is surely a better-than-average one.

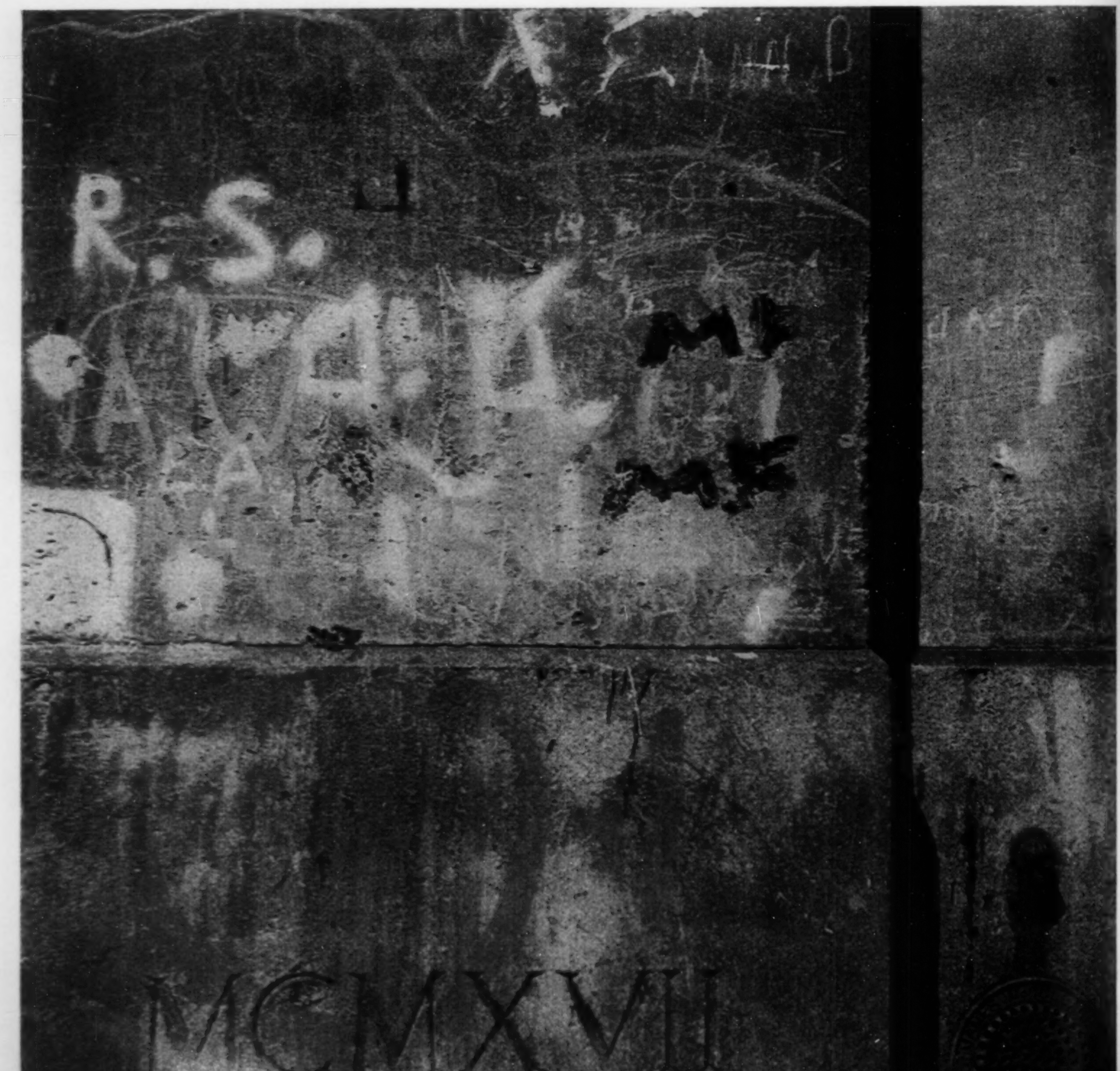
In many ways, Rockefeller Center has always been a special case. Started in 1928, at the height of the boom, it was originally conceived as a new and distinguished site for the Metropolitan Opera Company. Approached for help on the project, John D. Rockefeller Jr. found the venture one which "commended itself to me as a highly important civic improvement"; in due course, he agreed to supply the land, at cost, for the Opera House and to give the city enough additional acreage to set it in a public square. With the depression, however, the vision of the opera vanished, and Rockefeller, as he later said, found himself "committed for a long-term lease [on the land] wholly without the support of the enterprise . . . around which the whole development had been planned. . . . With the depression progressing rapidly it was clear that there were only two courses open to me. One to abandon the entire development.

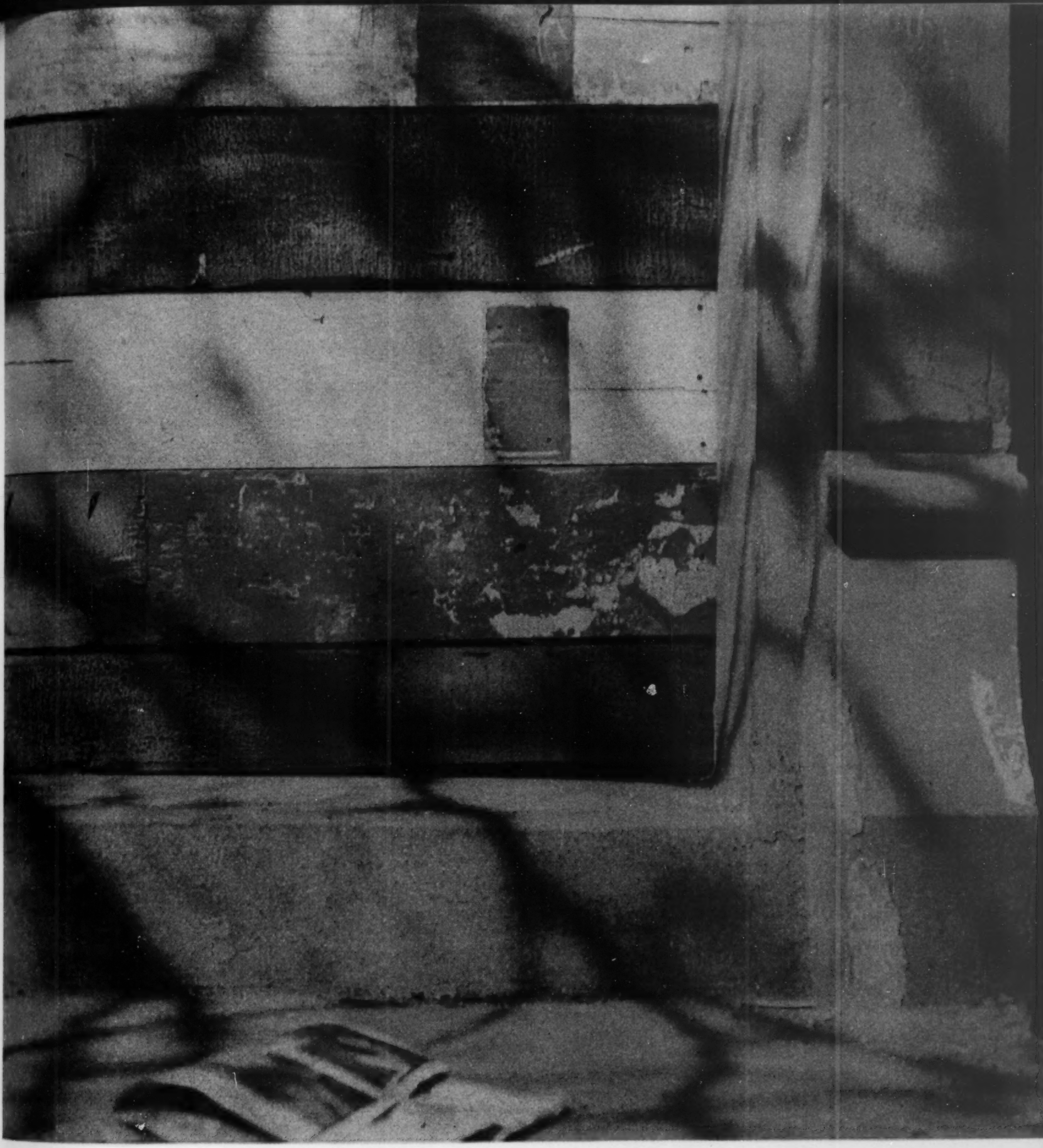
continued on p. 168

Gallery

Color accidents

American cities other than Boston, Charleston, and New Orleans are notably lacking in small harmonies for the eye. But there is a stimulating counterpleasure to be found in certain metropolitan by-streets. This is the restless, cacaphonic design created by time, the weather, neglect, and the fine hand of delinquent youth. The bitter colors and ironic forms splashed and molded on many an old door or torn wall have their own way of arresting attention. In Manhattan, these wry compositions abound; but they must be collected with care. A certain authority about, and taste for, these "finds" comes to the practiced specialist once he starts the hunt. All except one of the examples on these pages were found on East 85th St., New York. —WALKER EVANS



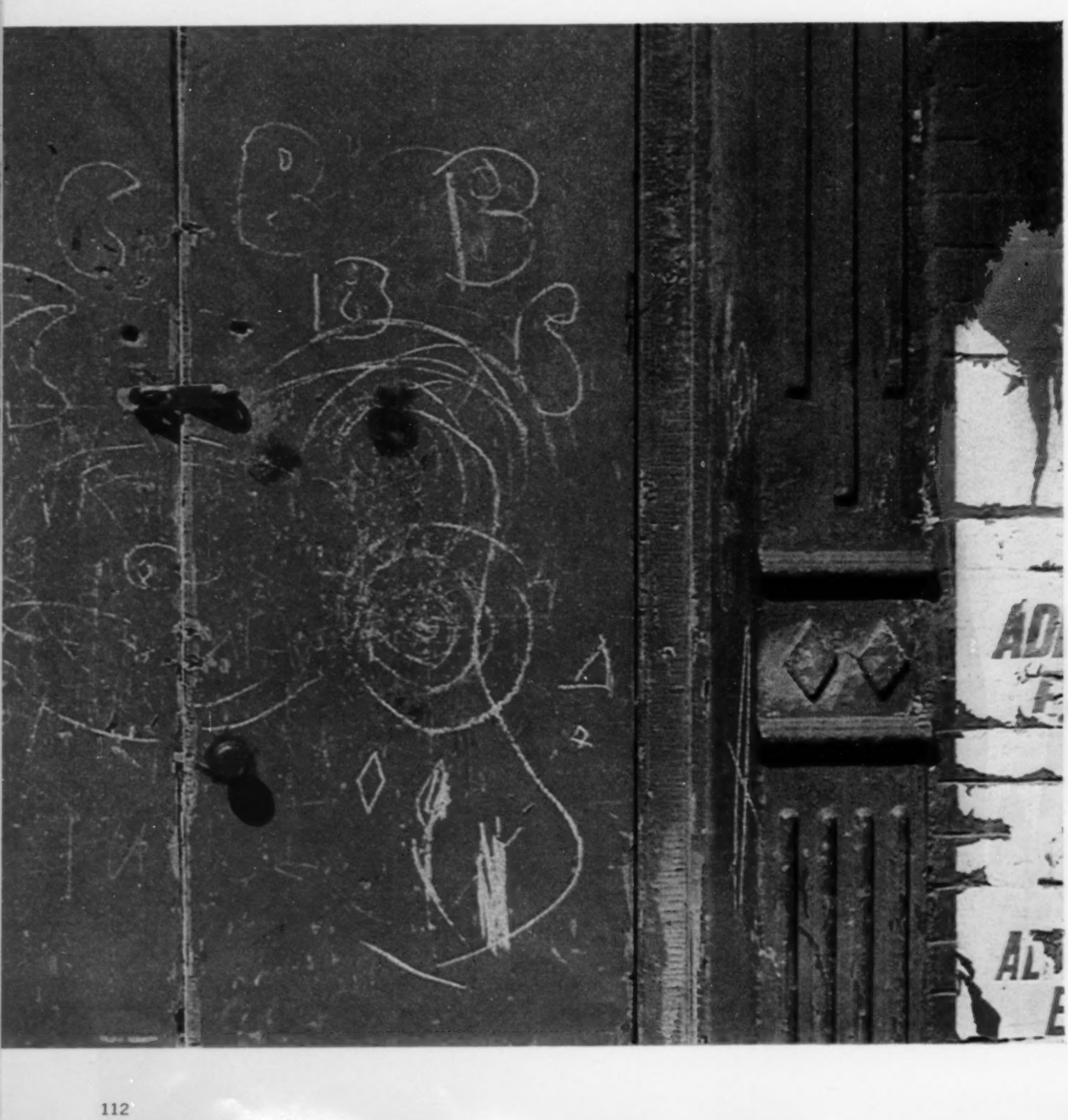


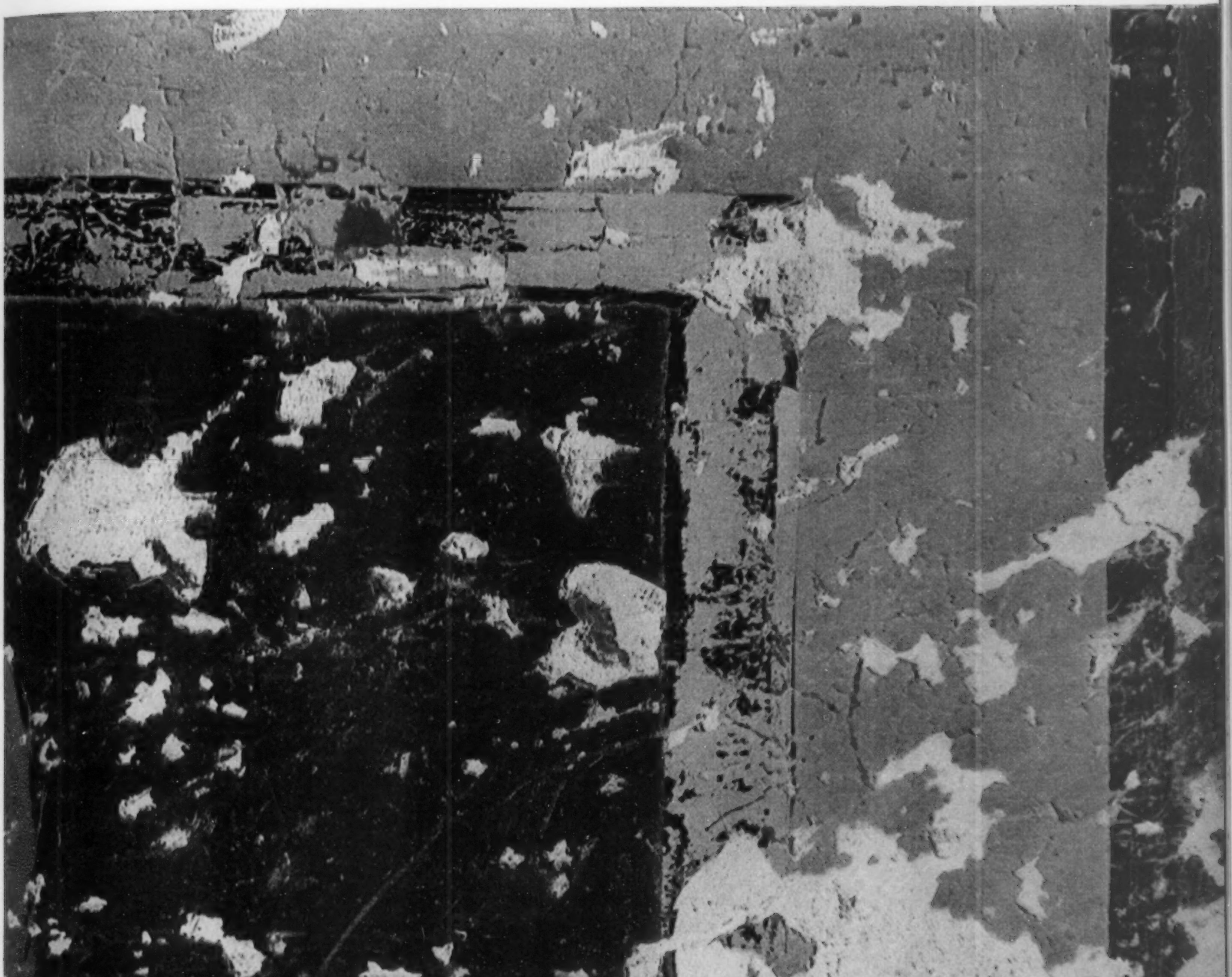
A dappled patchwork of lavender, old blue, and pale ochre is assuredly beyond the imagination of the most intrepid colorists alive. In terms of painting, this composition should fall somewhere between the work of Klee and that of Congo the Chimpanzee of the London Zoo.

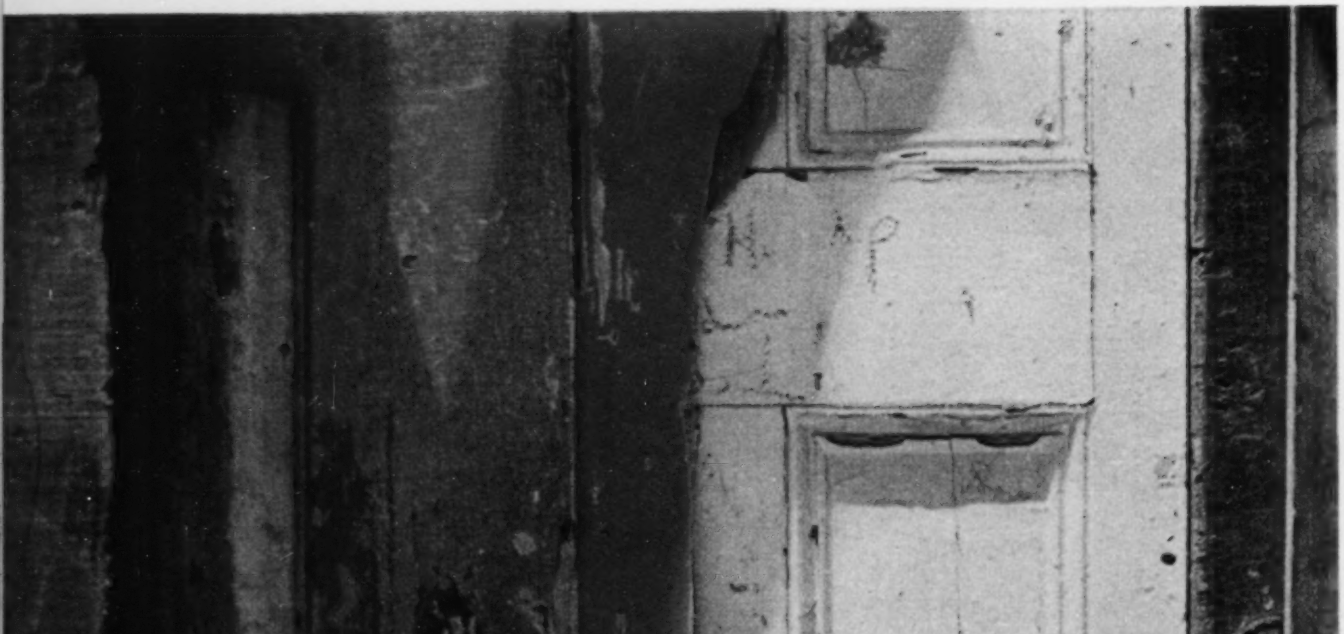
It will be the privilege of this cornerstone
to stand in insulted majesty as long as possible.
Rome was not destroyed in a day.
Here, wall writing is as it should be, illegible,
its form in no way obscured by meaning.

The pocks and scrawls of abandoned walls recall the style of certain contemporary paintings, with, of course, the fathomless difference that the former are accidents untouched by the hand of consciousness. Paul Klee would have jumped out of his shoes had he come upon the green door below. The courage, purity, and gaiety of these scarlet shots in violent green space would be applauded by all the Klee audience.

Similarly, the subtle explosion which is the photograph at the right might have been a conception of Jackson Pollock's. Such specimens may serve as a reminder that it does require authority to bring off a painting with something new in it; for a perfect painting, immense authority.



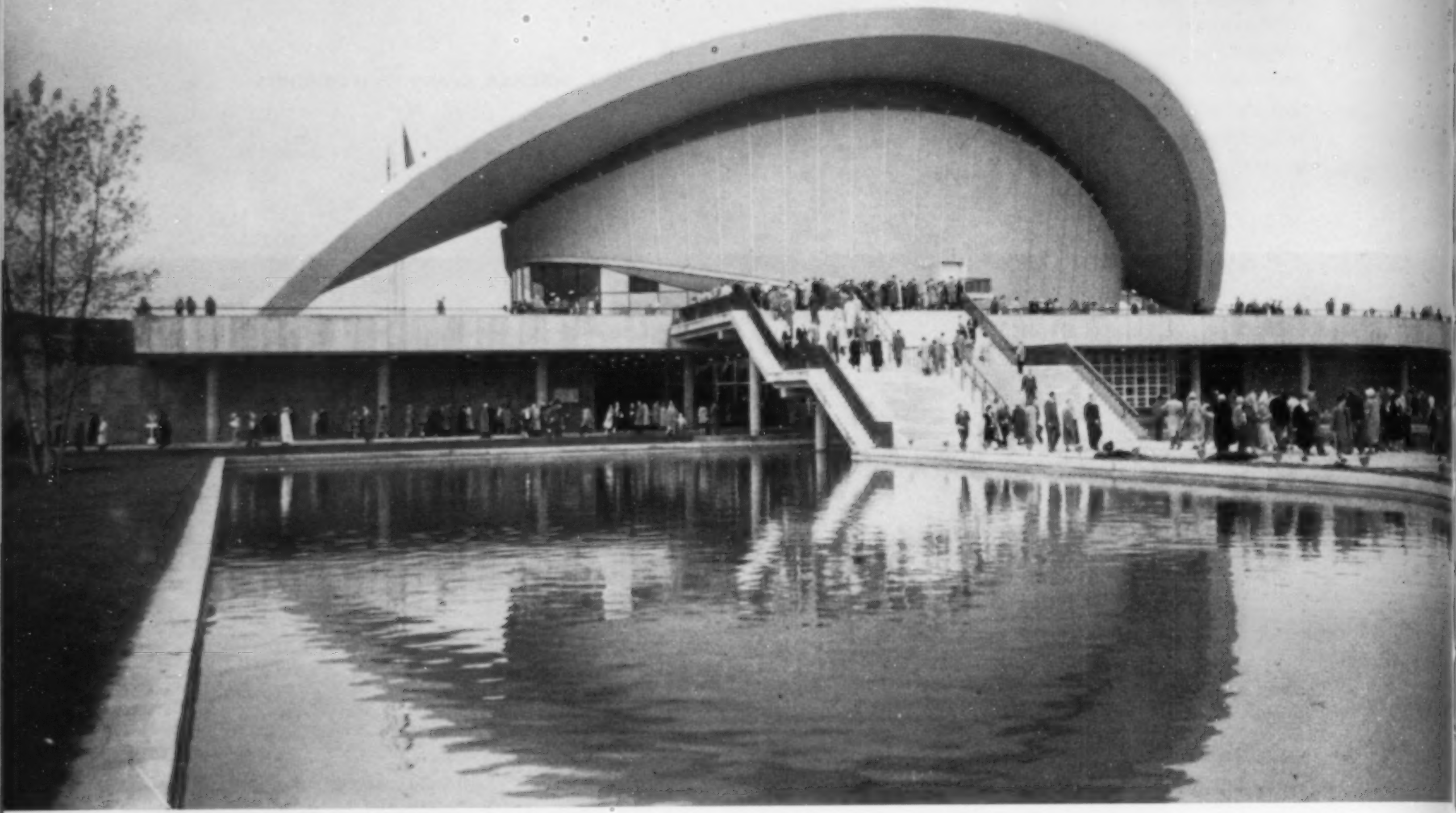




Some day, a bright young stylist in the world of modern architecture is going to borrow color haphazardry, most consciously, as motive for an outside wall— say on a pavilion or an estate playhouse. The painted old doors like those now used to board up demolition sites will be an excellent source for some really daring tone patterns.

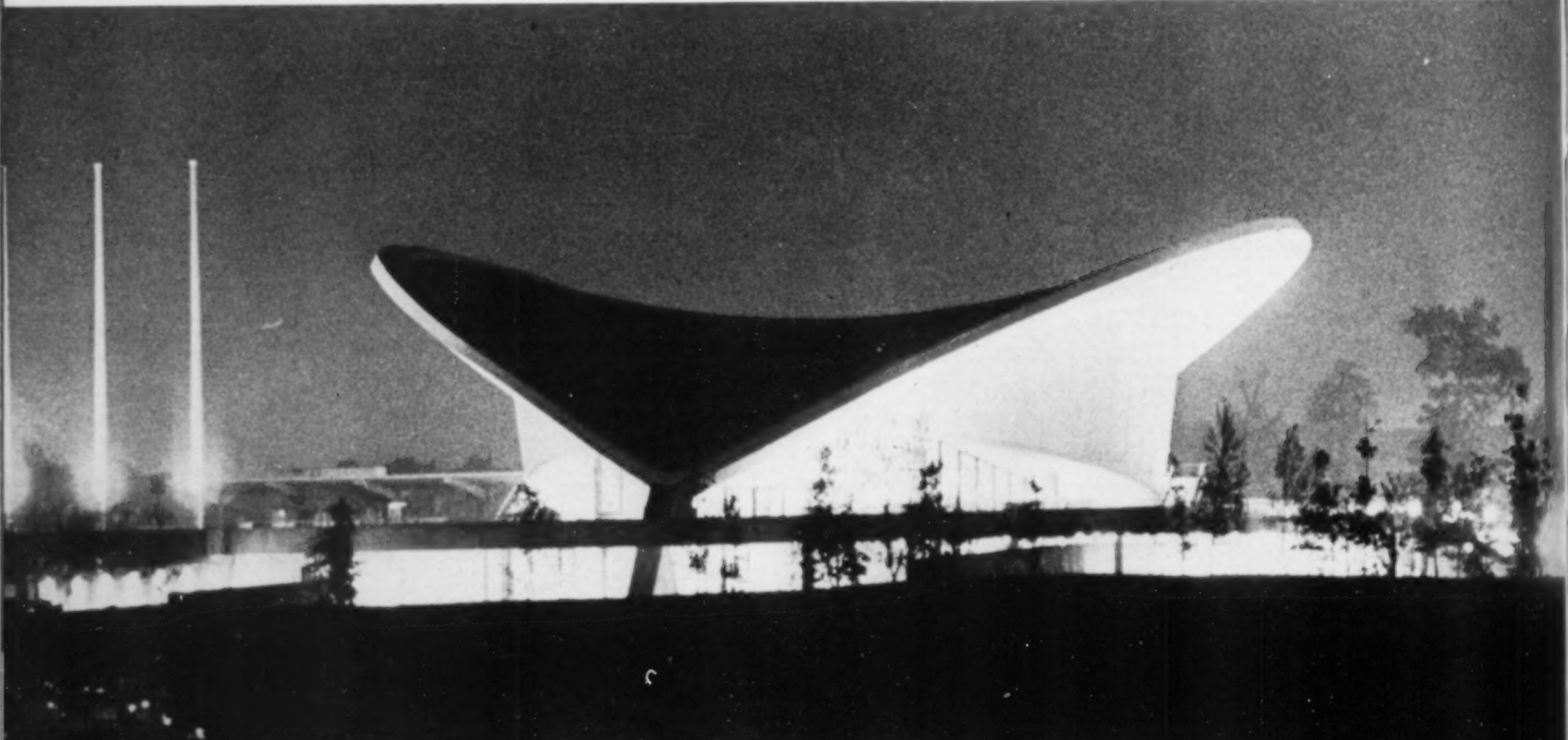
Lest the building materials of
the future engender no patina whatever,
certain nicely encrusted objects
may well be recorded now.
Decorative design itself, such as
that on this ponderously charming door—
as modish as a celluloid collar—
is surely being threatened by the forces
of speed and utility.

WALKER EVANS PHOTOGRAPHS



Changing shape of Berlin's Congress Hall is mirrored in the reflecting pool (above) and in the River Spree (below).

PETER CURLIS



Symbolizing free speech, the U.S. contribution to Berlin's international building exhibit has already provoked some. Here a German critic and the American architect discuss the building itself

The Congress Hall debate

In April, 1955, Mrs. Eleanor Dulles, the State Department's special assistant on German affairs, met in the bombed-out Hansa District of West Berlin with Architect Hugh Stubbins and a three-man A.I.A. committee (Chairman Ralph Walker, Howard Eichenbaum, Moreland Smith). Their task: to discuss with Berlin authorities a suitable U.S. contribution to Interbau, the international building exhibit, which would turn the district into a model of reconstruction (FORUM, Sept. '57). The question at hand: how best to spend the joint U.S.–West German funds available for the part of the exhibit shared by the U.S.[*] Their answer: build a hall to house international meetings of cultural or scientific groups. Located here, on the very edge of the iron curtain, the building would stand as a permanent symbol of one of the West's most cherished possessions: free speech.

Architect Stubbins' design for the Congress Hall has stimulated a gratifying amount of free speech among architects and engineers. The bold structure with its dramatic roof form has raised a whole range of questions—from the logic of the structure to the efficacy of the building as a symbol. With modern architecture in a dramatic condition of change, the Congress Hall provided a focusing point for discussion on this subject above all others.

Last autumn, when the Congress Hall was already in use, FORUM asked Frei Otto, Berlin architect, author, and expert on suspension structures, to make a critical appraisal of the building to cap-off the world-wide debate. He agreed, provided that Stubbins and Fred Severud, structural engineer for the building, also participate. Their exchange of views, polite but pointed, begins at the right.

Otto: Berliners accepted the Congress Hall with unprecedented enthusiasm even before it had taken final shape. Here was a new idea of a building for our time: to strengthen and improve human understanding—a shelter for free speech and discussion among friends and strangers. Without doubt, this idea in itself is a great achievement.

Stubbins: One of the most satisfactory experiences of my career has been that acceptance—not only of the idea but of the finished building expressing it. The program was noble; the challenge to an architect was exciting, sobering, and heightened by its purpose and location. The building is not a temporary exhibition pavilion but a permanent contribution to the cultural facilities of a great city, dedicated to responsible freedom of expression.

Otto: Located in the Tiergarten, facing the River Spree, the building has the best location Berlin could offer (photo on page 118). Halfway between the centers of east and west Berlin, it will be a focal point for the city after East and West are reunited.

Undoubtedly, such a building in such a location deserves the most careful critical consideration. But such consideration is, for me, a most

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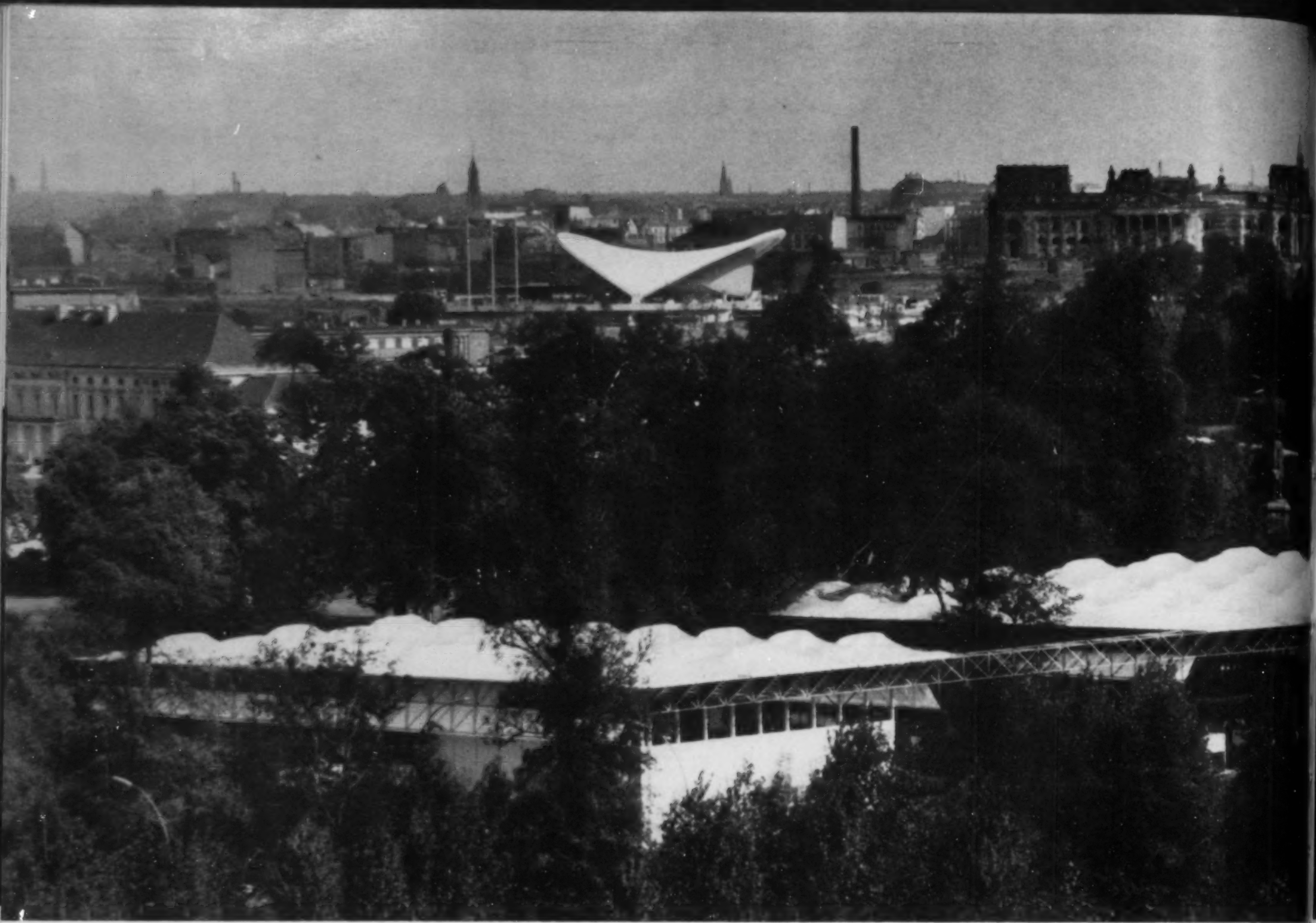
[*] Since available U. S. dollar aid funds were limited, it was necessary to call upon the cooperation of the city of Berlin and the Federal Republic of Germany. The counterpart resulting from Marshall Plan loans, services and expenditures of the city of Berlin in preparing the site, and new dollar aid totaled almost $5 million. The project was sponsored by the specially formed Benjamin Franklin Foundation, of which the A.I.A. committee was the nucleus.



Beyond a temporary Interbau pavilion (roofed by Frei Otto) the Congress Hall stands out against the Berlin sky line

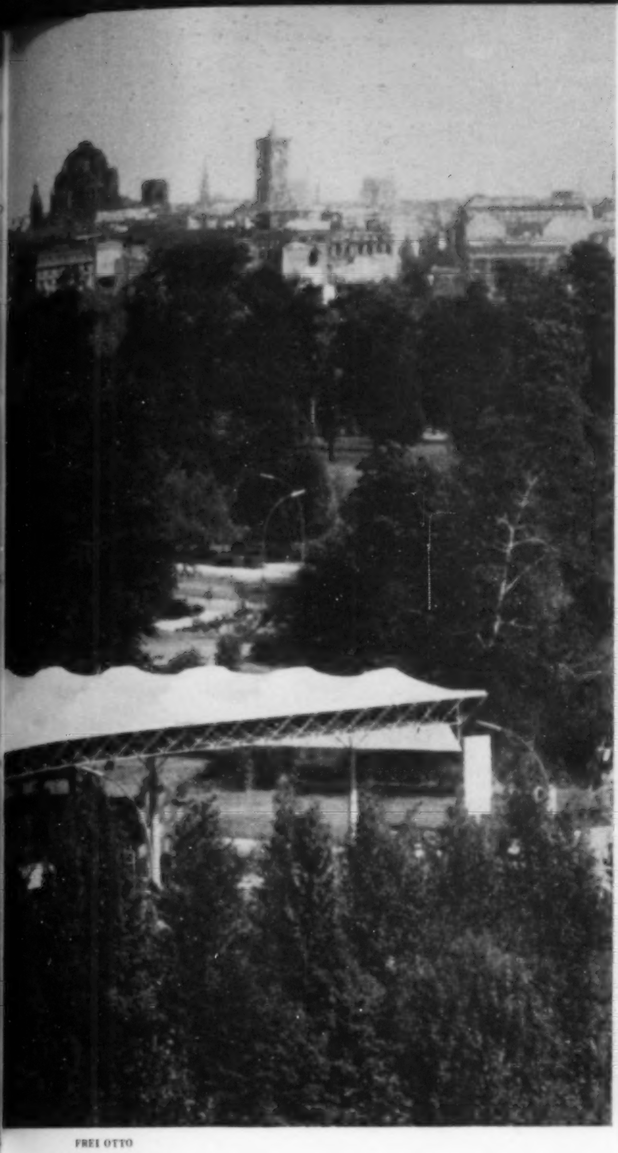
difficult task. I feel handicapped because of my esteem for the distinguished architects and engineers who designed this building. Moreover, it may seem ungrateful of me, as a Berliner, to criticize this gift of the United States to my city. But I hope that this criticism will serve a useful purpose.

Stubbins: The building is intended for free discussion, so criticism is welcome.

Otto: The over-all idea of the plan is convincing. An auditorium, studios, smaller meeting rooms, a theater, an exhibition hall, and a restaurant are organized around the great foyer (plan, opposite page). But for a building serving a continuously changing public, the arrangement could be somewhat clearer. The difficulty of organizing all the facilities within the predetermined square form is quite apparent.

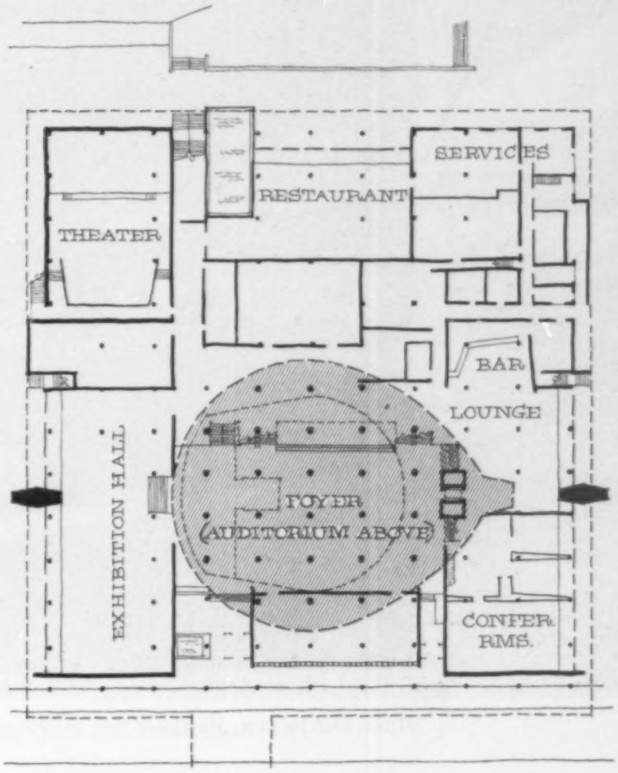
Stubbins: It seemed necessary and important to develop in the organization of these facilities not only a workable relationship but a vivid, peripatetic environment as well. Here, casual forming of groups, strolling, viewing, and discussing, could take place in the presence of meaningful architectural relationships. This development was carried out without any sense of constraint from the peripheral rectangular shape.

In the most complex condition of use, the auditorium is the culmination of the preparational activity which goes on throughout the entire domain of the building. The continuous interaction of the ancillary facilities is desirable and necessary to prepare for and support meetings in the auditorium. It therefore seems appropriate to have a central foyer to which all major and subsidiary spaces are related. Upon entering the foyer, there is no doubt about the location of the auditorium. The upward slope of the foyer ceiling (created by the sloping auditorium floor) immediately locates this room for any visitor.

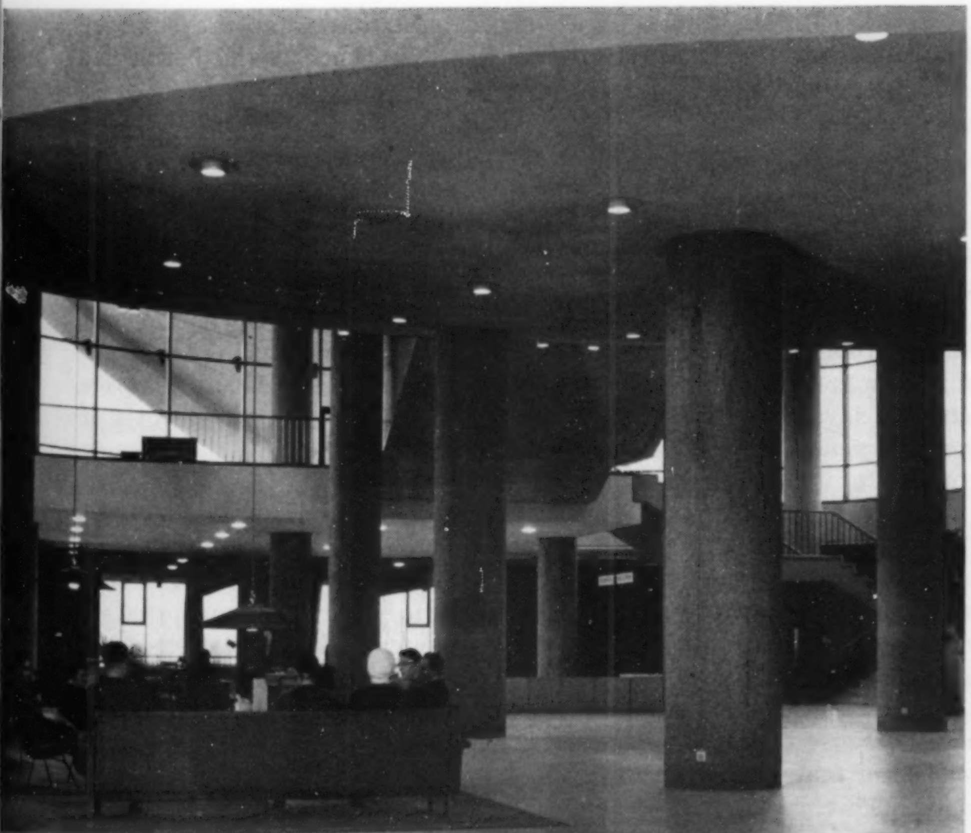


FREI OTTO

CONGRESS HALL, Berlin, Germany
ARCHITECTS: Hugh Stubbins & Associates
John Myer, Jack Gensemer (associates)
SUPERVISING ARCHITECTS: Werner Duettmann & Franz Mocken
STRUCTURAL ENGINEERS: Severud, Elstad & Krueger
ACOUSTICAL CONSULTANTS: Bolt, Beranek & Newman, Inc.
GENERAL CONTRACTORS: Philipp Holzmann,
Grün & Bilfinger, Wayss & Freytag

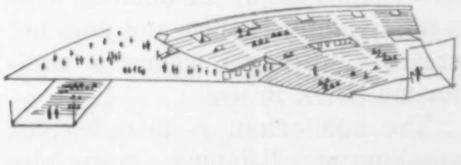


GROUND FLOOR PLAN

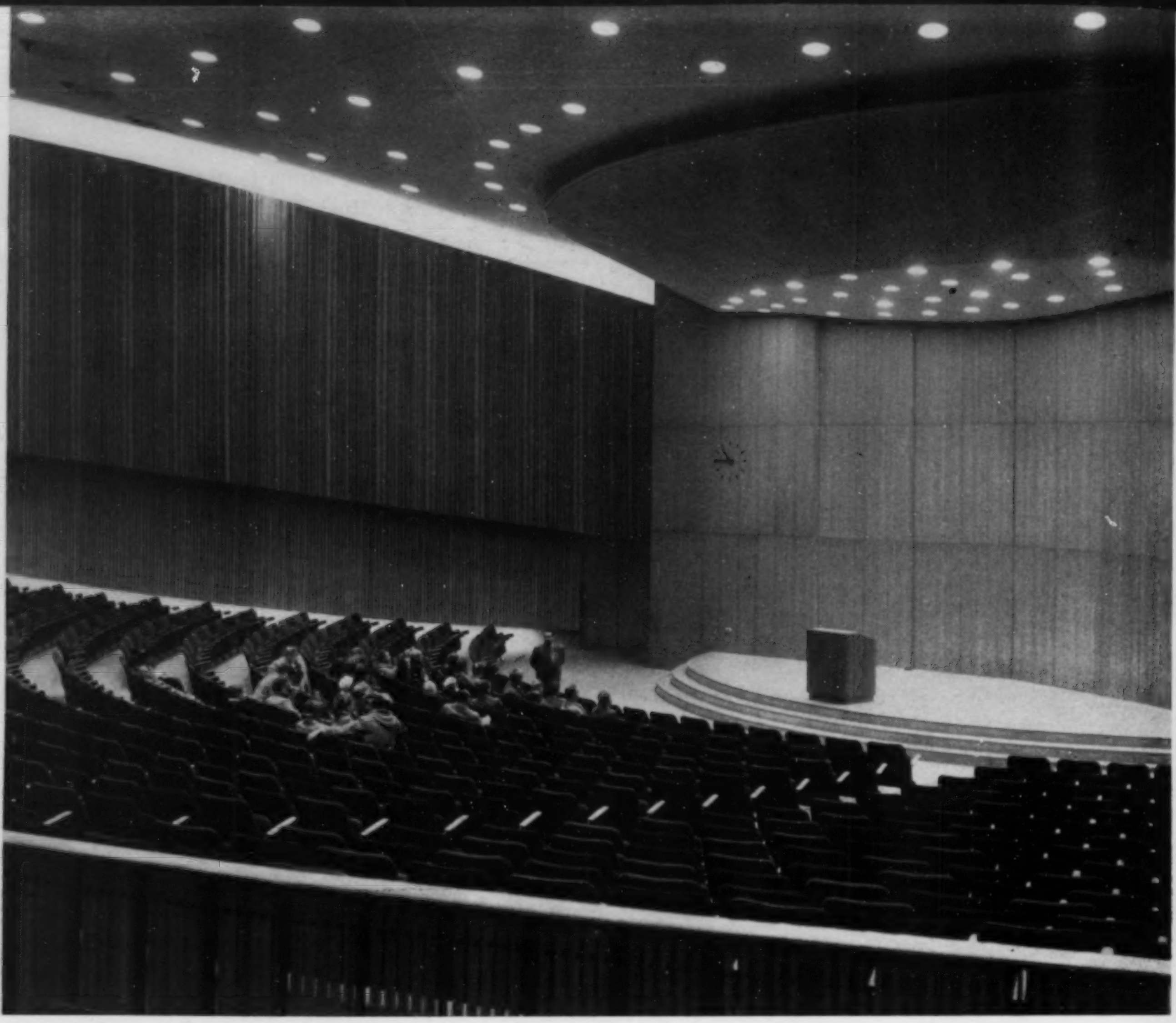


FRITZ ESCHEN

Otto: The connection between the auditorium and the foyer is not ideal. The interior stairway is inadequate, while the outside stairway to the terrace is tremendous (photo top page 116). Access to the hall itself is not so arranged that listeners can come and go during the discussion without causing a disturbance. Only a hall with an "open door" (sketch above) allows free speech without forcing anyone to remain. The inadequacy of circulation is further compounded by the side exits which lead to the outside.



Stubbins: The ample flight of stairs leading from the foyer to the mezzanine "garderobe" (photo left), then up toward the light and to the auditorium, forms one portion of the not only efficient but unhurried environ-



Main auditorium, designed for music and speech events, seats 1,250

ment. This is one of the two main entrances to the 1,250 seat hall. The other, leading directly from lounges, bar, and conference rooms, arrives at the front of the room. The side exits are for emergency use only and are required by law.

The vertical separation of the auditorium and the lower adjuvant spaces, moreover, permits simultaneous multi-use of the building with a minimum of conflict and does not create a dead spot when the auditorium is not in use.

The auditorium is intended for speaking and listening—music also was anticipated—so that acoustic considerations were of paramount importance. Restricting the number and location of entrances minimizes rather than creates disturbance. Although access is ample, and entrances and exits are convenient, the space is essentially designed for those who want to listen and participate, not primarily for those samplers who pop in and out between seat and bar, not sure where they want to be and afraid to miss the best of each. The "open door policy" would be burdensome to control and would compound an acute acoustic problem.

Otto: The building is excellently detailed, and every color is tastefully selected. Placement of heating grills is not left to chance, and no secondrate materials are used. Even the coarse linen fabric in the massive wood grill in the hall has been interwoven with silver threads.

The stone veneer for the walls and the marble of the benches (which are big enough for Roman senators) are of the finest quality. Each piece of furniture comes from an internationally known designer, and underfoot are terrazzo, thick velour carpets, and marble.

Stubbins: Praise of the details and the choice of materials is naturally welcome. This is all part of the design process and did not just happen. (The marble benches were made purposely wide to eliminate an undesirable railing which would have been needed at the stairwell behind the bench if the bench had been narrow.)

Otto: Visually, every possible optical illusion is used to destroy the boundary between indoors and outdoors and between some interior rooms.

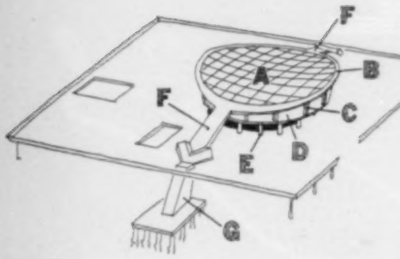
Stubbins: Although no special thought was given to the interpenetration of inside and outside space, it is satisfying to have the opinion that this exists.

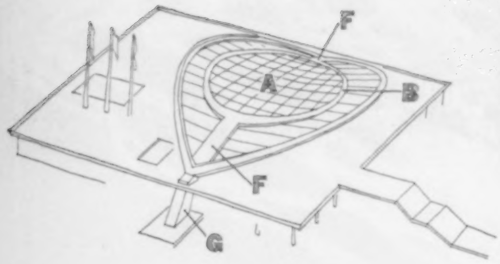
Otto: The illusion is created that the roof of the Congress Hall is suspended between two tilted arches, drawn together and supported on two points—like the well-known Cattle Judging Pavilion in Raleigh, N.C. (FORUM, Dec. '57)—but without vertical side walls.

Severud: This is not an illusion. The ends of the roof from each abutment to the walls surrounding the auditorium (photo right above) are fully supported by the arches.

PHOTOS: FRITZ ESCHEN

Abutment and arches can be seen from inside the upper lobby





Otto: However, since such a roof would be inherently unstable, it had to be engineered and built in an entirely different way. The roof over the auditorium itself (figure A, sketches left above) is surrounded and supported by a rigid reinforced concrete ring (B). This ring is supported in turn on the walls of the hall (C), the floor of the hall (D), and the columns beneath it (E). Two heavy compression beams (F) transfer part of the load to the anchor points (G) and prevent the concrete ring from deforming under excessive roof loads. These beams are now hidden in the roof slab. If the concrete ring had been strengthened, they could have been eliminated entirely. But since the roof slab was available, this solution was employed instead.

Severud: For the arches not to be relieved of some of the load by the supports of the room would be to build a monument for the architect and his engineer at the expense of the owner. It is important to note here that one of the primary requisites was that no expansion joint could be tolerated between the room and the roof since the acoustical consultant claimed that no satisfactory joint has ever been developed that would allow freedom for structural movement without sound leaks.

Otto takes issue with the employment of part of the canopy roof to reduce the bending moment in the ring by a compression member within the roof surface. Is it wrong to use a medium already in existence in direct compression rather than to strengthen the ring? Stresses flow by a direct path unless they are artificially prevented from doing so.

Otto: The two slanting outer arches are, in effect, hung from the inner ring. They carry very little of the roof, and their considerable weight serves largely to prevent deformation upward under wind suction.

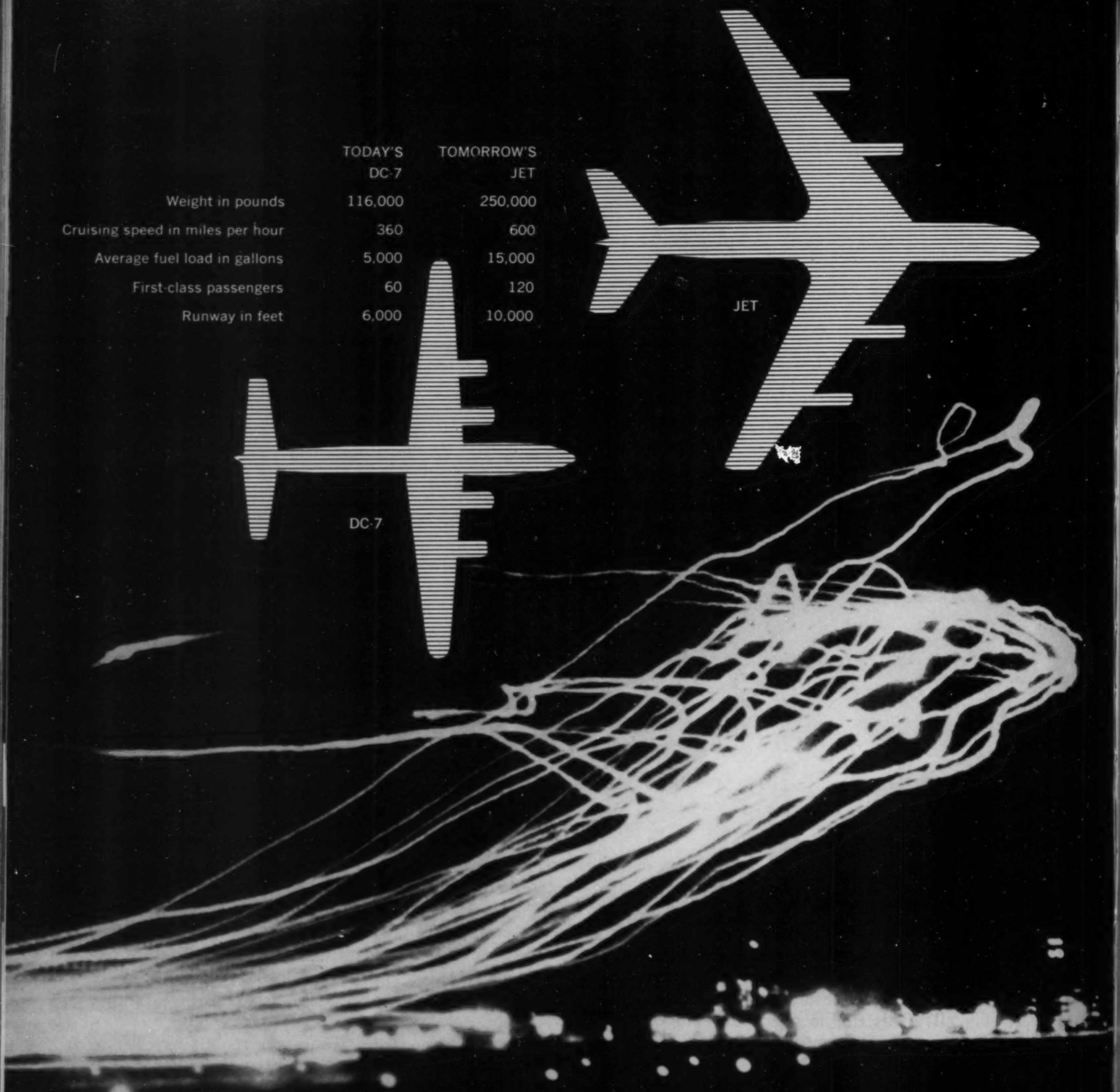
Severud: Gently to pooh-pooh the function of the arches in resisting wind uplift is easy in writing. But our considerable experience in this field has proved that wind is the No. 1 enemy of hung roofs. Hung structures are very sensitive to unequal wind loads, as evidenced by the famous Tacoma Bridge failure.

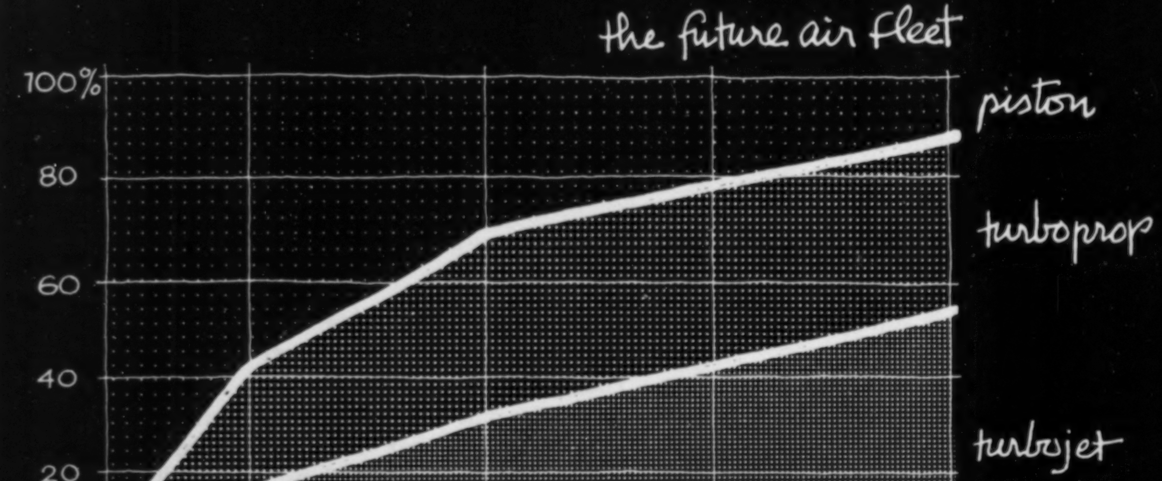
Otto: The outer roof is exposed to different conditions of temperature than the inner roof because the auditorium is heated when the out-of-doors is cold, causing a different rate of expansion. This complicates deflections produced by differences of wind or snow loading across the roof as a whole. Therefore, a series of parallel expansion joints was introduced in the outer roof dividing it into a series of completely separated strips of reinforced concrete warped to follow the shape of the roof. These strips can twist, causing movements which the roof membrane must follow.

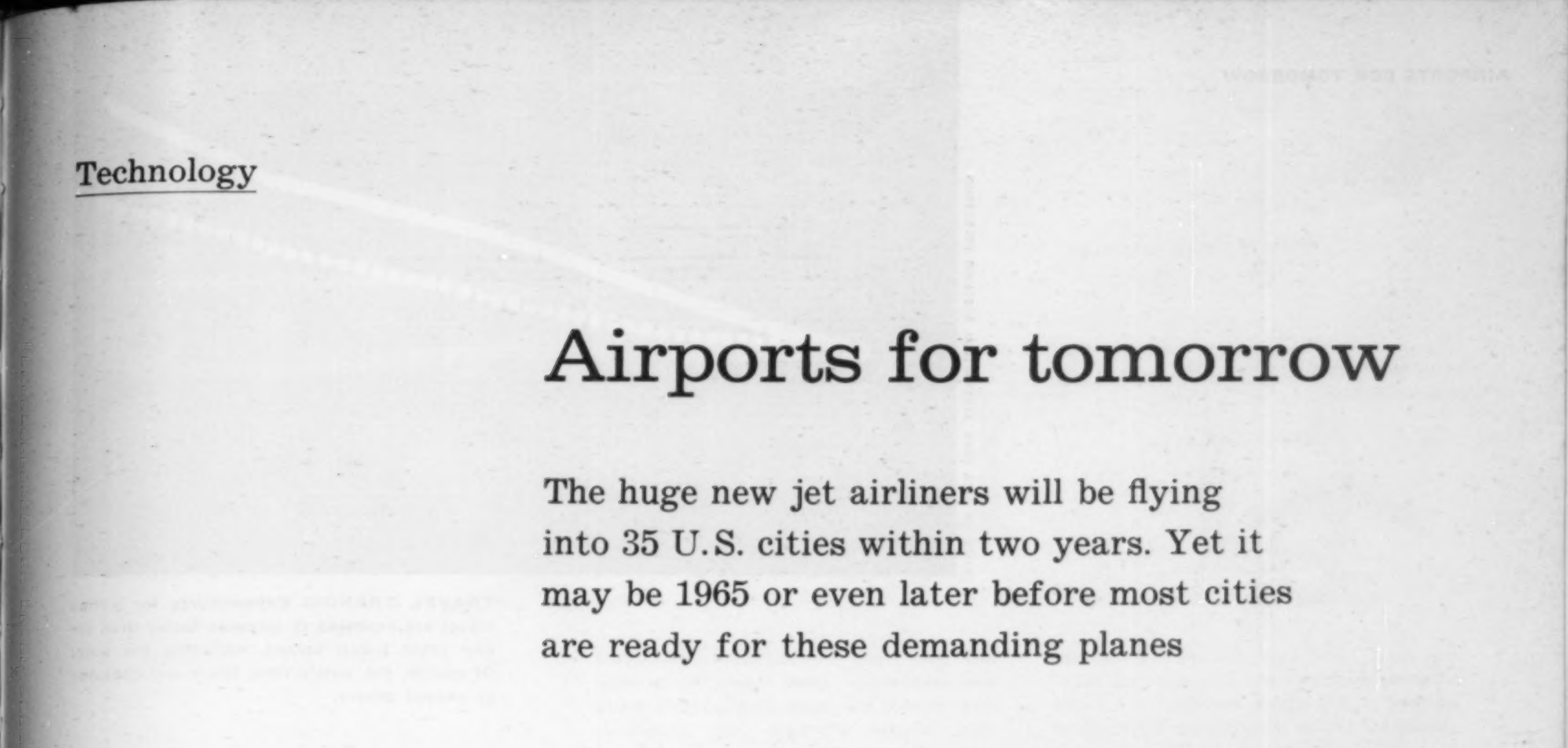
Severud: This is not a proper analysis of the function of these trans-

continued on p. 170

	TODAY'S DC-7	TOMORROW'S JET
Weight in pounds	116,000	250,000
Cruising speed in miles per hour	360	600
Average fuel load in gallons	5,000	15,000
First-class passengers	60	120
Runway in feet	6,000	10,000







Airports for tomorrow

The huge new jet airliners will be flying into 35 U.S. cities within two years. Yet it may be 1965 or even later before most cities are ready for these demanding planes

Most American cities harbor two hazardous misconceptions about the jet airliners that will begin operations in the U.S. next year. The first is that the jet is "just another airplane," albeit bigger, faster, and more costly than today's planes. The second: that these giant ships, the largest commercial planes ever built in this country, are strictly long-haul planes, not destined to stop en route on their transcontinental and transoceanic flights. Unless these misconceptions are corrected, most U.S. cities will be unready for the jet age or will badly bungle it, for the jet airliner requires radically new concepts of airport design.

The fact is, of course, that the jet is a basically different—and very demanding—aircraft, as shown on the opposite page. It is nearly twice as fast as today's fastest commercial plane, but twice as fuel-hungry; it has capacity for twice as many passengers, but is twice as costly. And engine noise, already bothersome with piston-engine planes, becomes a critical factor with the jet, both in community relations and in airport design.

Yet if handled properly and worked hard, the jet can reach a new level of transportation economy. American Airlines, for example, estimates that 100 jets could do the work of its present fleet of 200 piston-engine planes. But proper handling means judicious planning of terminal operations—plane maneuvering and fueling, passenger and baggage handling—so that precious time will not be lost on the ground. As one sage prophesy goes: "If you don't fly these planes, they'll break you."

Indeed, the determination of success or failure for an airline in the jet age may be made on earth, at the airport, and not at an altitude of 40,000 feet. And a key figure in making or breaking the jet age may well be the architect. In large measure, it will be his responsibility to pull together the elements into an efficient airport system. For example, United Air Lines, which, like American, is engaged in a detailed analysis of its future jet operations, including an evaluation of a plethora of devices and systems for handling planes, passengers, and baggage, is determined to squeeze airport time between flights to 30 minutes. And American, with even higher hopes, intends to squeeze it to 20. Within this period, the plane must be unloaded, refueled, reloaded. Using today's techniques, with smaller planes and fewer passengers, this job now takes about 30 minutes and, of course, with the bigger jets it would take longer. Indeed, if the airport designer looks on the jet as just another plane, then time between flights will stretch to more than one hour, and possibly to more than two. And, furthermore, passenger annoyance, now piqued by long check-in queues on departure and baggage melees on landing, will surely reach its elastic limit.

Who will be ready?

It seems amazing that there should not be deep concern for meeting the jet age. No plane manufacturer, surely, would seem, would invest $185 million in a new aircraft, as Boeing has done in its 707 jet, or $175 million, as Douglas has done in its similar DC 8, or $50 million, as Convair has done so far with its 880, without penetrating thought as to how its customers, the airlines, can make the most efficient use of the more than 350 jets now on order.

The airlines, in turn, would hardly invest upward of $2 billion in these planes without serious consideration of the facilities for handling them. And it hardly seems possible that U.S. cities would plan to spend nearly $1 billion for new airport facilities without full knowledge or, at least, good indications, of the kinds of airports needed by 1965, when the jets will comprise almost a third of the commercial fleet.

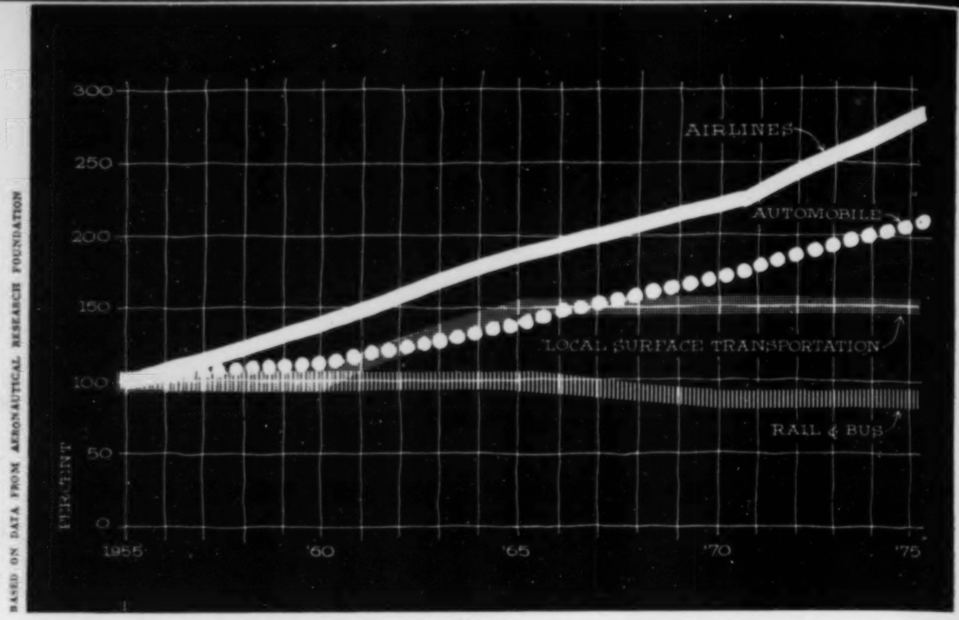
Yet, with few exceptions, the nation's airports will not have adequate service, cargo, and passenger facilities for these new planes unless swift moves are made now. General Milton Arnold, operations and engineering vice president of the Air Transport Association, estimates that within two years jets will be flying into more than 35 U.S. cities. Of these cities, only nine or ten will have made even the most minimal preparation.

In part, this unpreparedness is due to a complacent and mistaken belief in the long-haul, nonstop concept, the second misconception of the jet age: that the jets will skip most of the U.S. and fly only to the largest cities on both coasts, plus a few large inland cities such as Chicago, Dallas, Atlanta, and St. Louis.

The fact is, seven years from now, when the jets will fly to most major cities of the U.S., airports not only will have to cope with the new planes, but also with nearly twice as many passengers. According to the Aeronautical Research Foundation, which has prepared a forecast of aviation activity for Edward P. Curtis, special assistant to President Eisenhower for Aviation Facilities Planning, nearly 85 million

THE FUTURE FLEET: By 1965, the jets will make up nearly one-third of the commercial U.S. fleet, while piston planes will dwindle. Source: Cornell Aeronautical Laboratory. Background: night photo of landing planes.

PHOTO BY ANDREAS FEININGER—LIFE



TRAVEL TRENDS: Expenditures for airline travel are expected to increase faster than for any other travel means, including the auto. Of course, the auto's total share will continue to exceed others.

passengers will be carried on domestic airlines in 1965, or about twice as many as were carried last year. And by 1975 passenger volume will almost double again, to 153 million.

But in this confusion, in these dawn days of a new age, there is also a good chance for airport betterment. To the airlines, the age brings two new incentives. First, the lines must develop more efficient ways of handling planes, people, and cargo, based strictly on the necessities of economic operation. Second, with flying time reduced between Chicago and New York, for instance, to 90 minutes, no matter which airline is flown, the competitive edge will go to the line which learns to handle its passengers most efficiently on the ground, at ticket counters and at baggage claim. American Airlines' head of jet planning, Marvin Whitlock, says: "We've pretty well exhausted the opportunities for competitive advantage in in-flight service. We can all buy the same equipment. The only chance for competitive advantage will be on the ground."

This philosophy has yet to overtake every airline. One major line, for example, far from being overwhelmed by the problem of distributing baggage to 150 passengers from a jet coach flight, thinks it may hold the people in the plane until the bags can be unloaded and lined up at the foot of the portable stairway. When the bags are ready, the passengers will be released, file down the stairs, pick out their belongings as they walk toward the terminal "just the way the pullmans do it."

The new age: solutions

The age of jet travel can surely become the "fabulous" age it portends: New York to London in 6¼ hours; San Francisco to Chicago in 3½ hours; Los Angeles to New York in 4½ hours. Indeed, it represents a challenging second chance to do better.

The danger is the unwillingness of some key people to use foresight, a refusal to look toward 1975 and believe that more than 15 million people will fly out of Chicago that year, when only 4 million did so last year or that more than 2½ million will fly from St. Louis, nearly 8 million from Washington. This has consistently been the trouble in the past. And as estimates of future needs have always been low, facilities for handling traffic have never caught up, as any traveler knows who has used Chicago's Midway Airport or New York's La Guardia.

Of course, it has not been the airport planners alone who have guessed too low on the potential of the age. The airlines themselves have been wrong, time and again. Further, caught in a tight profit squeeze, with no major fare increases in several years, they have clung to ancient landing fees, established in times when an airport was a runway and a shelter. This denies the city the funds which expansion requires. In Denver, for example, the carriers pay only about 3 cents per 1,000 pounds of landing weight; the city insists that it must have more if it is to build adequate facilities: Consultant James C. Buckley holds that the fee should be 22 cents.

If the jet airport is to match the quality of the aircraft it serves, if it is to supply the same first class service at the terminal which the airlines will rush to supply in flight, then such antique ideas as the 3-cent landing fee and others must be forgotten. For jet airports will be costly. San Francisco, for example, which spent $14 million for its new terminal in 1954, has since received voter approval to spend an additional $25 million. Los Angeles' appropriation is $59.7 million to be raised by general obligation bonds, customary in most cities. And New York's Idlewild Airport, with its $30 million Arrivals building plus terminal facilities for 36 airlines, will represent a total investment of some $150 million when completed in 1960.

The jets alone, of course, are not responsible for these high costs; the major factor is the potential volume of air travel. Idlewild, for example, anticipates more than 11 million arriving and departing passengers per year by 1965, an increase of 145 per cent over traffic last year. But the jets will also add to terminal costs. Their size alone will demand longer concourses between terminal and planes to accommodate all planes at gate positions. Further, the nature of the jet engine, with its noise, blast, and fumes, necessitates concourse areas sealed tight to protect passengers. And this means air conditioning.

The sketches on these pages show how the new planes are affecting tomorrow's airport designs, and how variations in the methods of handling the aircraft can alter the design techniques. On the opposite page, for example, are shown three methods for bringing a plane to its gate position; no single concourse and gate design will be suitable for all three methods.

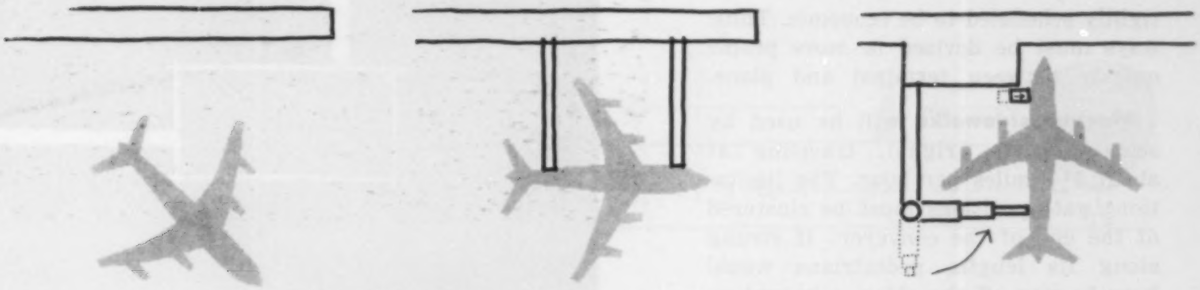
The problems of passenger and baggage handling, taken up on pages 126 and 127, also indicates that new techniques must be developed, mainly by the architects, if terminal operation is to be efficient. A high-speed baggage-handling system in development by United Air Lines, for example, would thread belt conveyors from the terminal area to the various gate positions, requiring the best kind of architectural planning in order that both bags and people may move without interference.

The problem of noise, which to date has probably given the plane manufacturers more difficulty than any other single problem, could possibly become the most challenging for the architect as well. The jets may be no noisier, it is hoped, than the noisiest of today's piston planes, if that is consolation, and in a well-sealed concourse area, the noise which does penetrate is not expected to be terribly annoying. However, in any large airport there will be areas which must be quiet: airport offices, for example, and the airport's adjacent motels. These are likely to be the real noise trouble-spots.

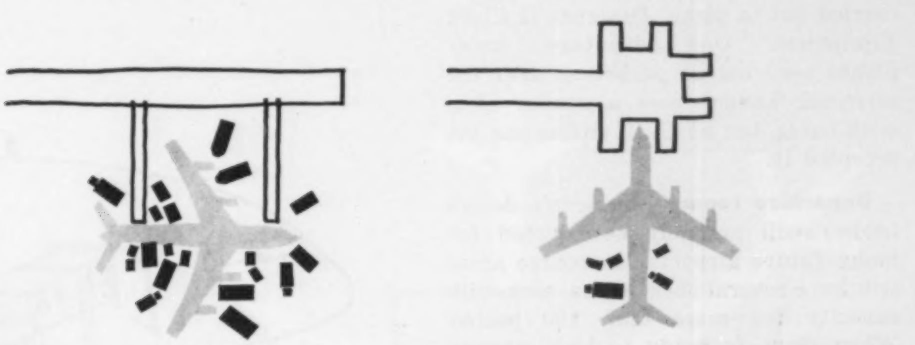
But in the age of the jet, with its noise, its necessary gadgetry, and its hordes of people, the most irksome problem of all may well be the king of the piston age, the automobile. Los Angeles' new airport (p. 129) will provide a 5,000-car parking lot, and at Idlewild there will be parking space for some 7,500 cars, and there are serious doubts that either will be sufficient. A basic planning objective at Los Angeles is to hold walking distance between auto and plane to less than 1,000 feet.

The air traveler, surveys show, is more likely than not a member of a two-car family, with one car for shopping and domestic rounds, the other for trips to the airport, where it sits until the return flight. Thus, as the architect battles airport sprawl, brought on by the biggest planes and terminals ever, he must also contend with this smaller finny monster, multiplying in such numbers as to cover as much parking space as the jet requires for runways.

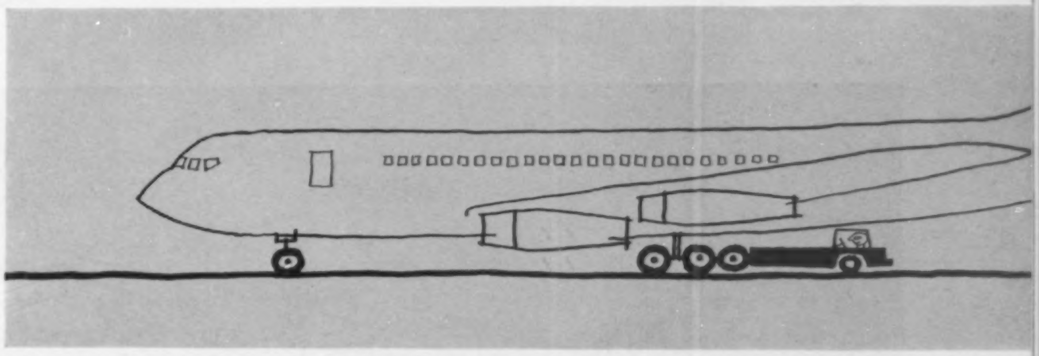
Handling the planes



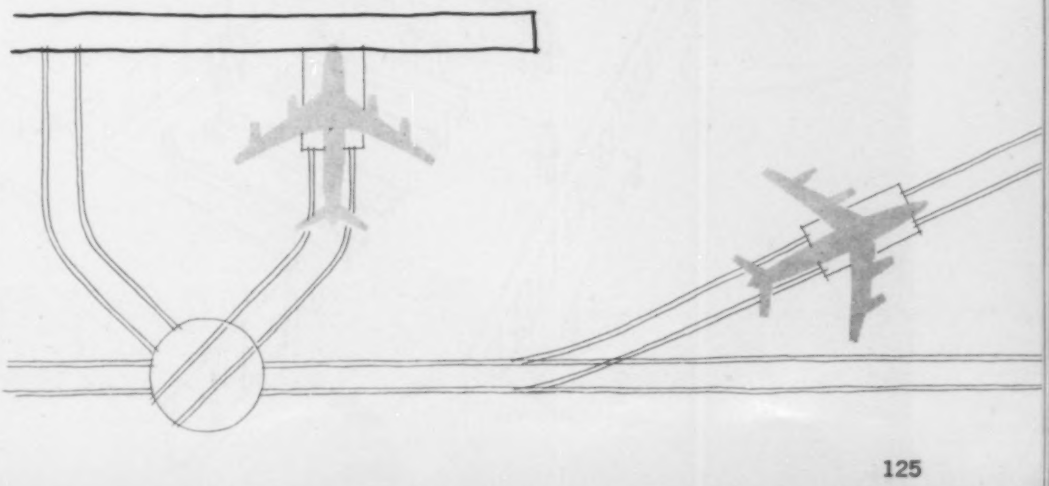
PARKING PATTERNS: Most jets will park at an angle (left); passengers will board from ground level via conventional stairways. But United's parallel plan (center) and America's nose-in (right) are more promising for the future: passengers board via Lockheed gangplank or loading bridge from second level of the concourse.



SERVICING: If serviced conventionally, jet ground operations would require all the service units shown above. Thus, many facilities, such as fuel, will be piped in underground to ramp, greatly reducing the swarm of servicing vehicles, as shown above.



MOVERS: Wheel-mover (above), by Air Logistics, feeds friction power to jet's landing gear wheel. Piggyback system (below), by Louis R. Inwood, carries plane on railed platform. But neither idea excites the airlines, because self-powered taxiing seems faster and cheaper. However, if jets taxi to terminal, noise will be a problem.



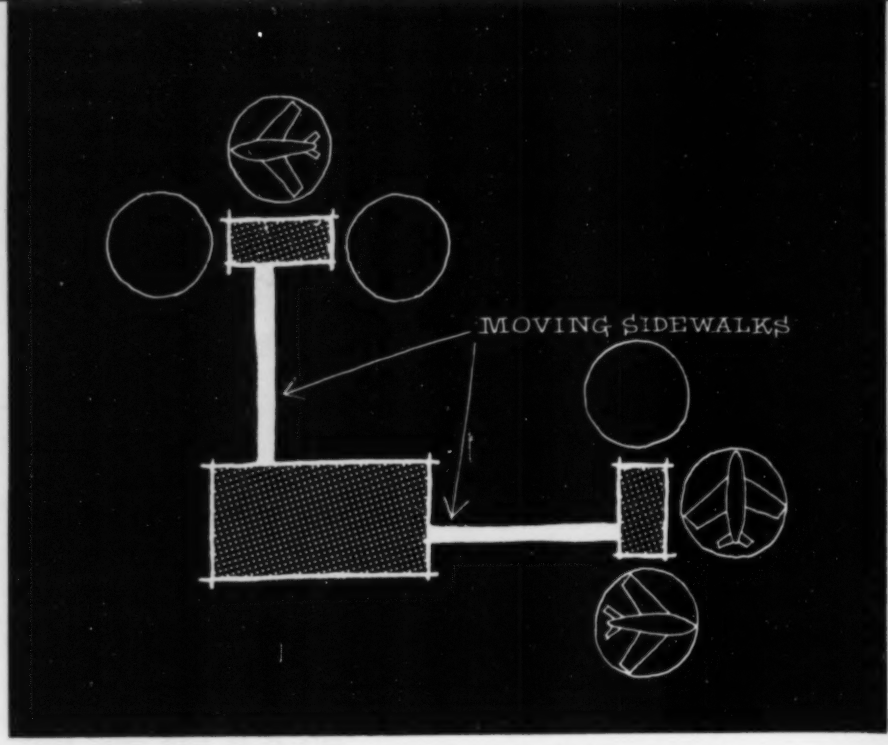
Moving people . . .

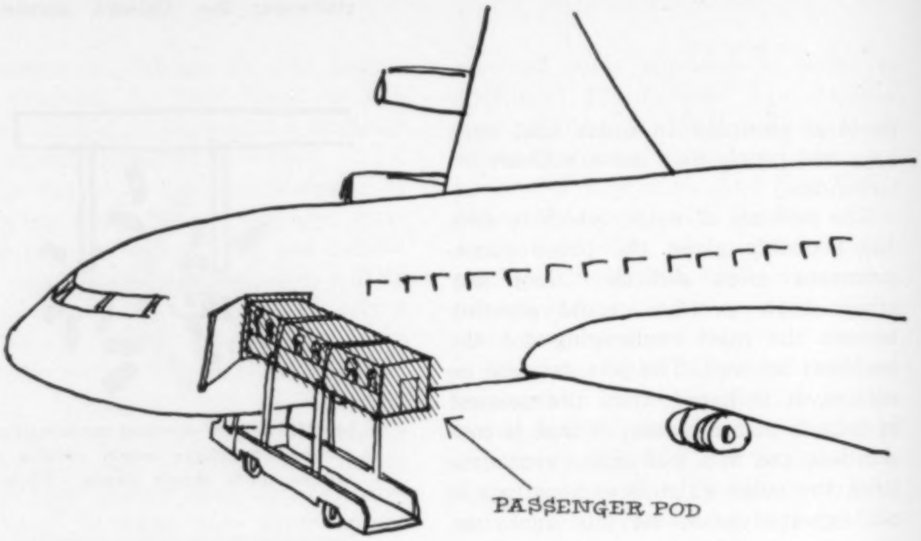
In the jet age, each plane must be tightly scheduled to be economic. Thus, ways must be devised to move people quickly between terminal and plane.

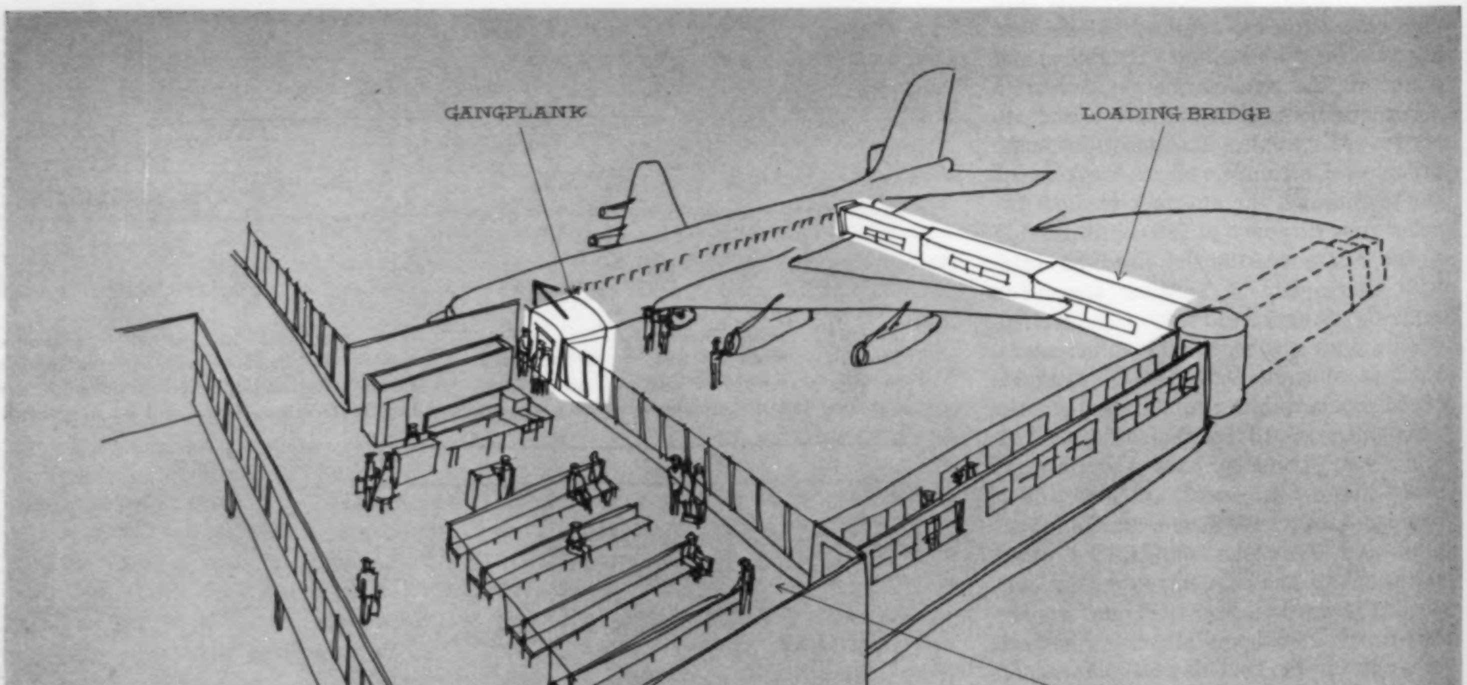
Moving sidewalks will be used by some airports (right), traveling at about 1½ miles per hour. The limitation: gate positions must be clustered at the end of the conveyor; if strung along its length, pedestrians would have to step off the sides, a hazardous procedure.

Passenger pod (right) collects passengers at the terminal, then pod is carried out to plane. Designer is Clark Equipment. One advantage: noisy planes need not be parked so near the terminal. London uses a similar idea, with buses, but no U. S. airline has yet accepted it.

Departure room (American's design below) will probably be adapted for many future airports. Concourse areas will have several such rooms, each with capacity for more than 100 people. When plane is ready to load, passengers will be nearby; boarding will be via short gangplank to nose, or longer telescoping bridge near tail.





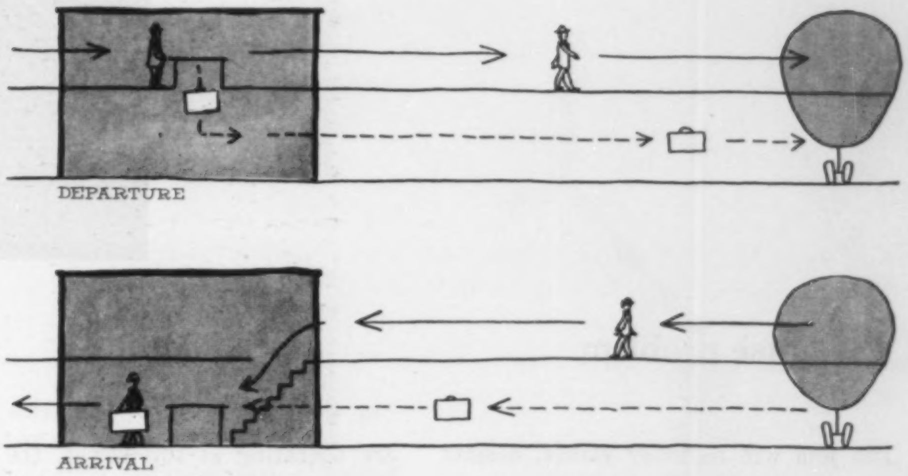


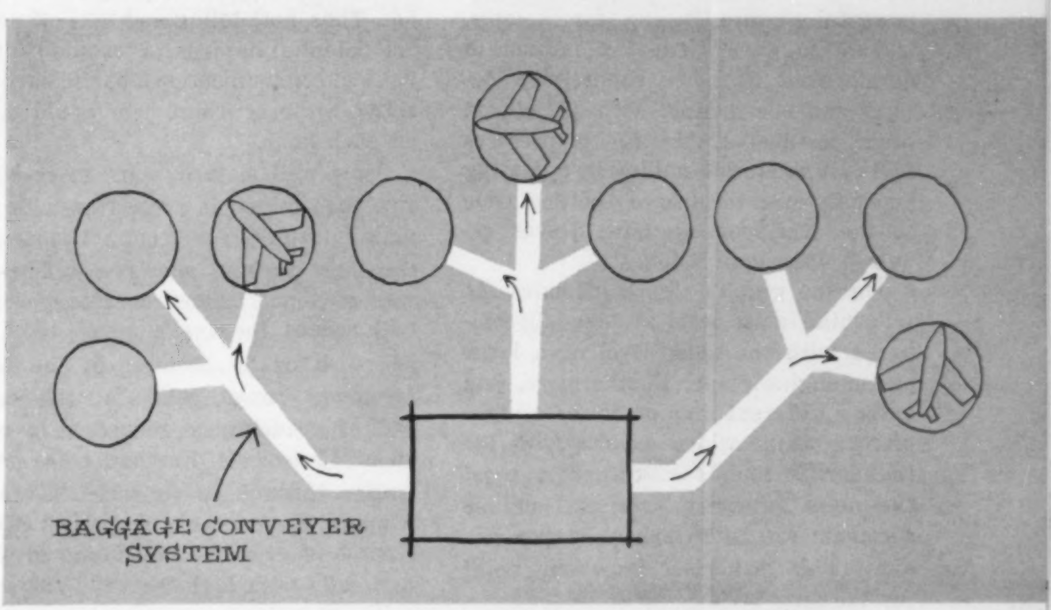
. . . and baggage

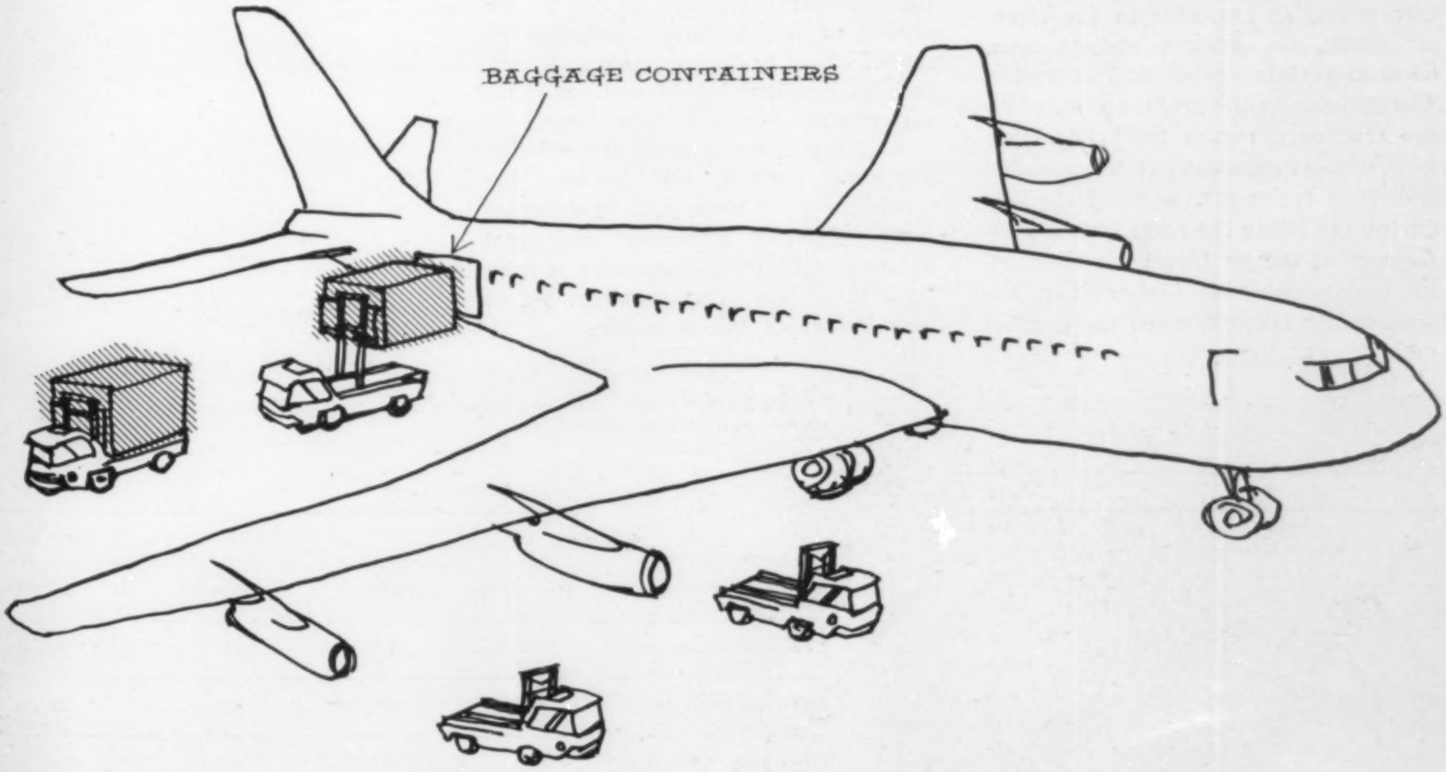
The two-level concourse (right) is planned for several large airports, eliminating the snarl of people and baggage. Departing passengers will move along a second level from the time they enter the terminal until they board the plane. Luggage will be checked at this level, in the terminal, then will be dropped to ground level and carted or conveyed by belt to the plane. De-planing passengers will walk from the plane on the second concourse level; in the terminal, they descend to ground level, baggage claim, and exits.

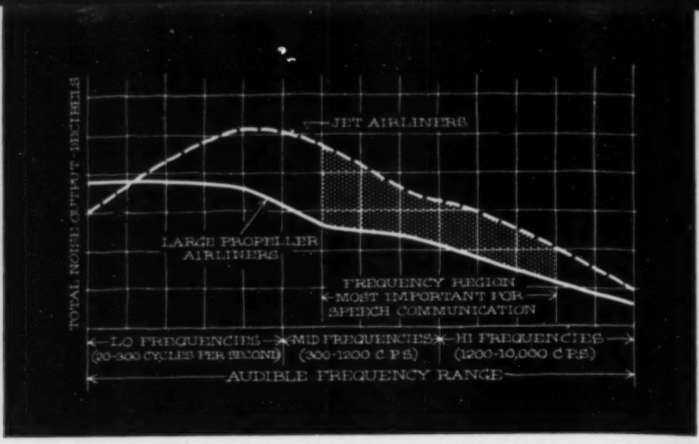
Belt conveyors for baggage handling (right) can be used extensively in a two-level plan. United Air Lines is developing a high-speed conveyor scheme, expects to unload its planes and have baggage ready for claim when passengers reach the claim area.

Plastic containers (below) are loaded and unloaded in the terminal; containers travel on flights. Ground manueverability is system's main advantage over a conveyor system. Its nemesis is the stopover, where only a few bags must be loaded or unloaded. Control Engineering and Lockheed are both designing systems.









NOISE OUTPUT of the jet airliner compared with today's piston plane, based on data of Bolt, Beranek & Newman.

The noise problem

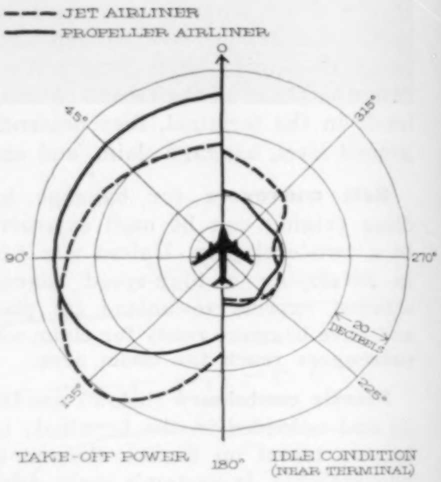
The jets will be noisy planes, despite the considerable efforts of the manufacturers and airlines to quiet their powerful engines. Boeing, for example, is said to have spent $16 million in development of noise suppression devices and one airline, with 30 jets on order, estimates that its suppressors will cost about $50 million in operating expenses over the life of the fleet, due to the sacrifice of engine power required for suppression.

The top graph (right) indicates the jet's high noise level at take-off, compared with the noise level of a large piston-engine plane. Furthermore, jets make a different kind of noise: a high-pitched whine which couples with the thundering sounds of thrust to boost the noise intensity over the audible spectrum (20 to 10,000 cycles per second). This is a most important point for the airport designer to understand, for he must know the kind of noise he is contending with if terminal walls are to be effective noise barriers.

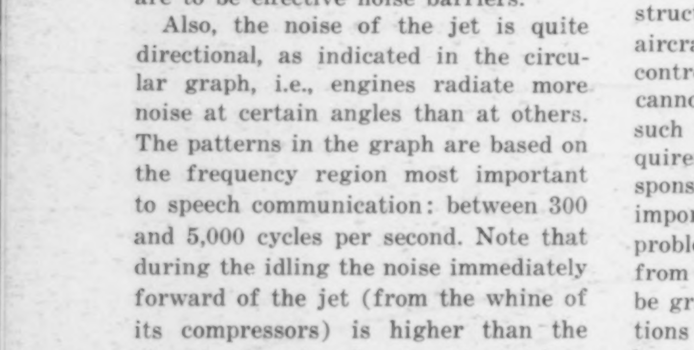
Also, the noise of the jet is quite directional, as indicated in the circular graph, i.e., engines radiate more noise at certain angles than at others. The patterns in the graph are based on the frequency region most important to speech communication: between 300 and 5,000 cycles per second. Note that during the idling the noise immediately forward of the jet (from the whine of its compressors) is higher than the piston's. At take-off, when the engines are operating at full power, the jet's maximum noise shifts around toward the rear of the plane; the piston's does not. Thus, both idling and take-off noise are potential hazards to terminal activity, e.g. communications, particularly at active airports where jets would take-off each hour.

Some wall materials are more effective than others in protecting a terminal's interior areas from jet noise. As the chart (below) shows, a well-sealed wall of 8-inch hollow concrete masonry will reduce the inside noise level by as much as 60 decibels in the high frequency range, while a well-sealed wall of ½-inch glass reduces it by only about 45 decibels. Further, noise penetration through poorly sealed doors or windows decreases the acoustical effectiveness of even the best-designed wall, especially with high-frequency noise.

Whether an airport's noise levels will be acceptable will depend on many other factors beyond the type of wall construction. Some, such as density of aircraft operations, will be out of the control of the architect, although he cannot afford to discount them. Others, such as terminal layout and space requirements, should be his direct responsibility. Because there are so many important factors, and because the problems of jet noise will be different from one airport to the next, each must be granted rightful recognition if solutions to jet age noise problems are to be satisfactory and economic.



DIRECTIONAL NOISE PATTERNS for the jet and the largest of today's piston planes, also by Bolt, Beranek & Newman. Noise output is measured between frequencies 300 and 5,000 cycles per second, the region most important to speech.



NOISE REDUCTION: difference between inside and outside noise levels, in decibels, under conditions shown at left.

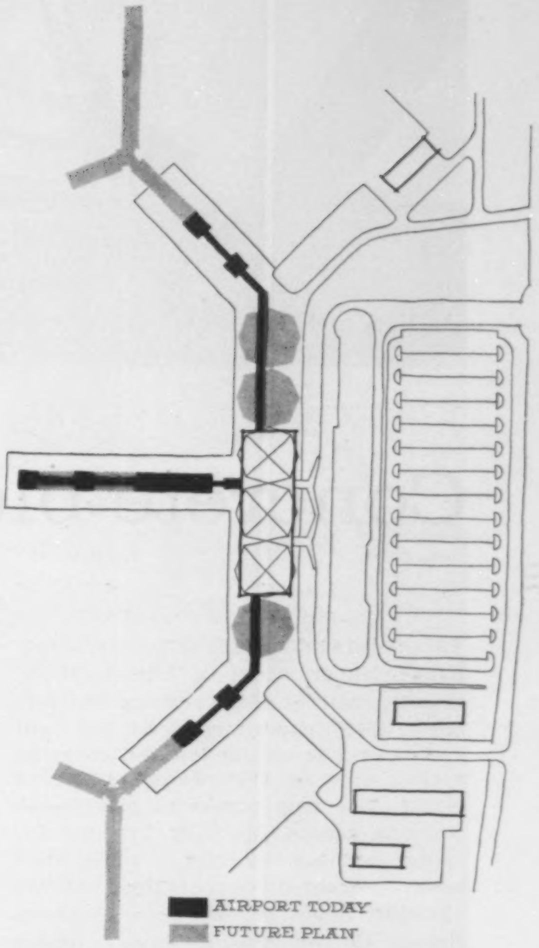
	Type of construction			
Frequency in cycles per second	½-in. glass	8-in. concrete masonry	double glass two ¼-in. panes 6-in. apart	if doors and windows are poorly sealed
Low frequencies 20-300	25	35	30	25-30
Mid freq. 300-1,200	35	50	45	30
High freq. 1,200-10,000	45	60	65	30

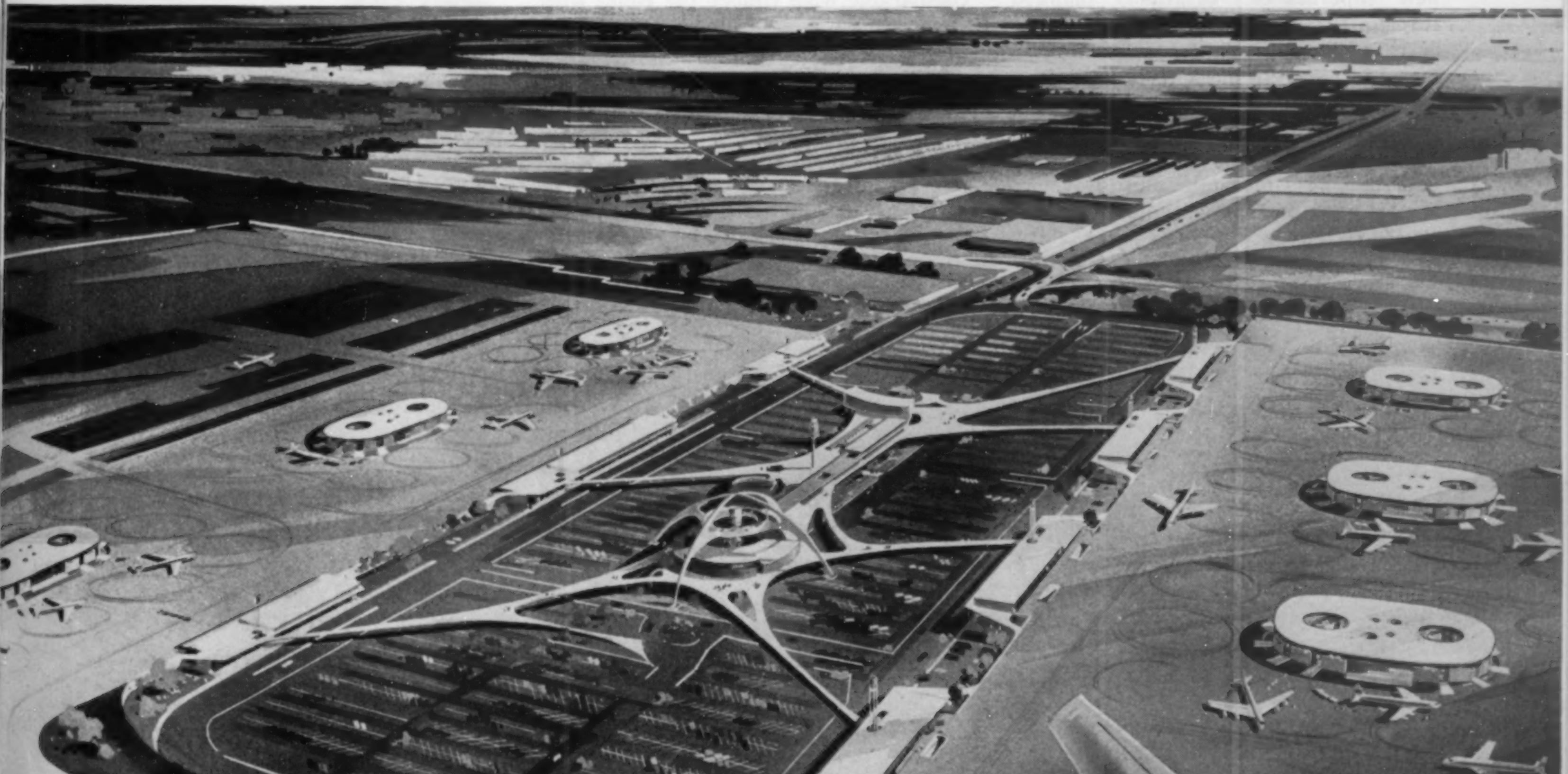
Two plans for the future

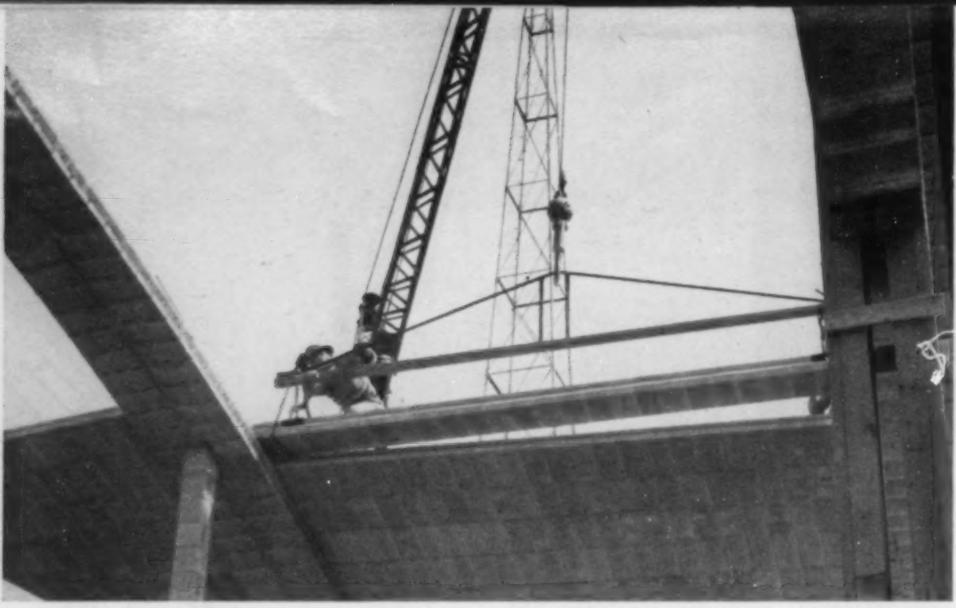
Two cities whose airports will be ready for the jet age and the growth it portends are St. Louis and Los Angeles.

▶ St. Louis' Municipal Field (right) was planned more than five years ago, before there were clear indications of when the jet age would begin and, indeed, before any airport designer could judge the nature of the jets, for none of the U. S. manufacturers had then even a design to show. But Architects Hellmuth, Yamasaki & Leinweber (now Hellmuth, Obata & Kassabaum) recognized that expansion was inevitable and that the new planes, of whatever shape and size, would require new concourse designs. They developed a flexible design which can change with time. For example, as the sketch shows, the terminal can be doubled in area, and the concourse areas can be widened and extended, with jet facilities provided at the extremities.

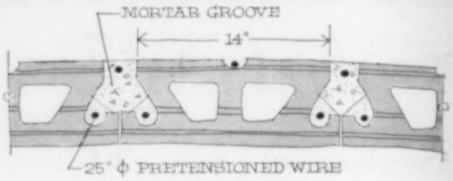
▶ Los Angeles' International, scheduled for completion in 1960, could anticipate jets with more assurance. (Plans were set in 1956, after a dozen airlines had ordered planes.) Thus, the plan was spacious, with seven satellite buildings linked by underground passageways to the parking lot and terminal buildings. But Los Angeles' real problem was one of trying to blend people, planes and autos, yet controlling the sprawl that each creates. Architects Pereira & Luckman, Welton Becket & Associates, and Paul R. Williams intend that this satellite design, with terminals surrounding a parking-lot nucleus, will restrict further sprawl, at least until after 1970, when air traffic will have increased threefold to 13 million passengers.







PREFAB PLANKS of concrete blocks (left) are lowered into place across prefab, prestressed concrete-block arches. Cross-section of roof deck below shows tension-wire action.



DETAIL OF ROOF SECTION

Concrete block arches

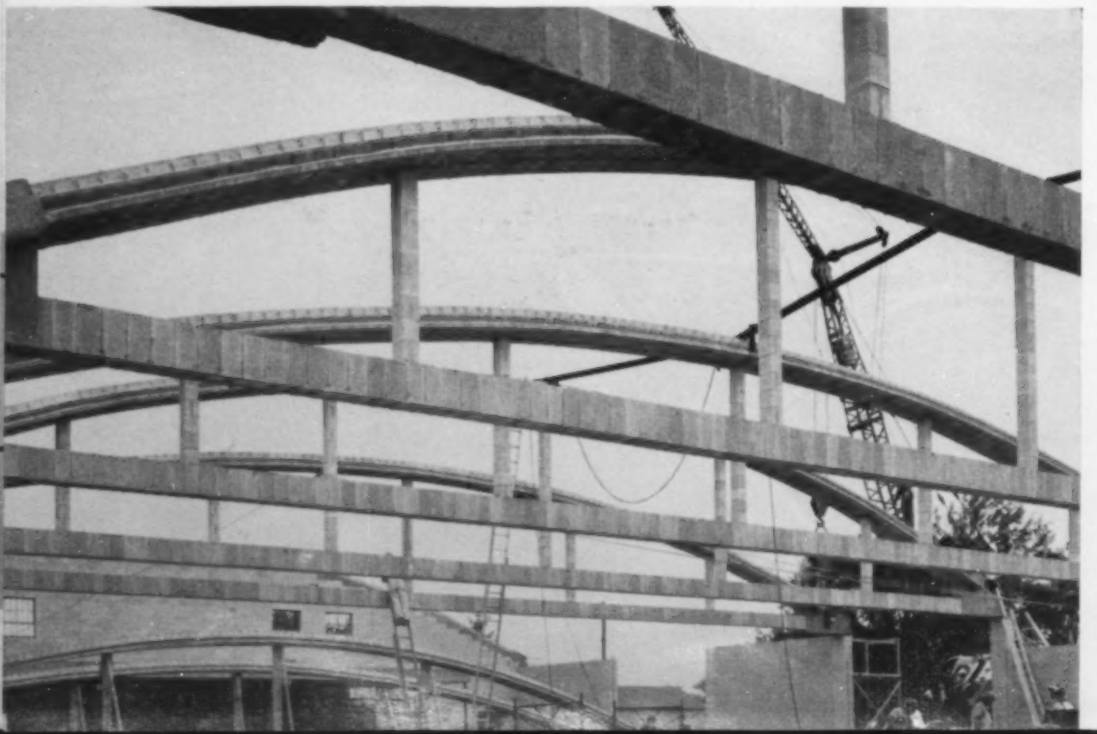
This novel curved roof structure, a new Kroger supermarket in Alpena, Mich., is built entirely of prestressed concrete block. As an experiment, even the light arches or bow-string trusses, covering a clear span of 100′, were built up of blocks. The long planks of prestressed concrete blocks, specially grooved for tying together by stress wires, had been pioneered some time before (FORUM, Sept. '51) by, among others, Besser Co. of Alpena, largest maker of concrete block machines. But the new supermarket, originally planned for laminated timber construction, was designed by Flint Architect A. Charles Jones in concrete block to provide Besser with an opportunity to try out the new technique in arches.

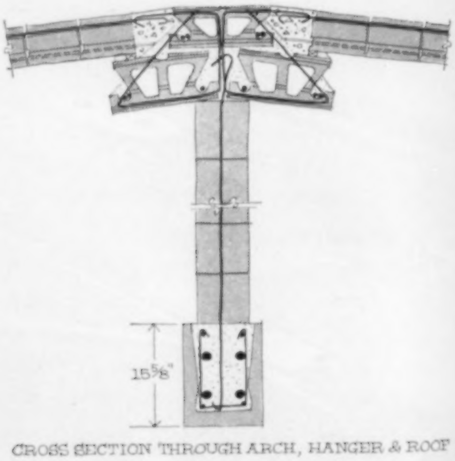
The arches, designed and tested by Prestressing Research and Development Corp., of San Antonio, Tex., are laid up, prestressed and grouted in light jigs on the ground, hoisted into place by crane. Then the similarly prefabricated concrete-block planks are laid across the arches and grouted to form a complete, continuous roof deck. By alternating the height of the arches—in this instance, between 11 and 13 feet—an undulating or folded-plate structure is formed, which in its interactions resembles shell or space-frame construction.

The advantages are: costs nearly comparable with timber (or equal with further use), weight 50 per cent lighter than solid prestressed concrete, and fire resistance superior to steel or wood. Eric Molke, arch designer, thinks the technique is capable of wide development for shell-like construction, without the need of expensive forms, in spans up to 200′.

ANCHORAGE of the bow-string arches to side walls is provided by precast reinforced concrete end blocks, being lowered below. They are mortared and tied in by wire later.

SPRING PHOTOS





CROSS SECTION THROUGH ARCH, HANGER & ROOF

CONCRETE-BLOCK ARCHES (left), each weighing about 20 tons, serve as flanged templates for bearing roof planks (detail is shown above). Grouting forms continuous shell.

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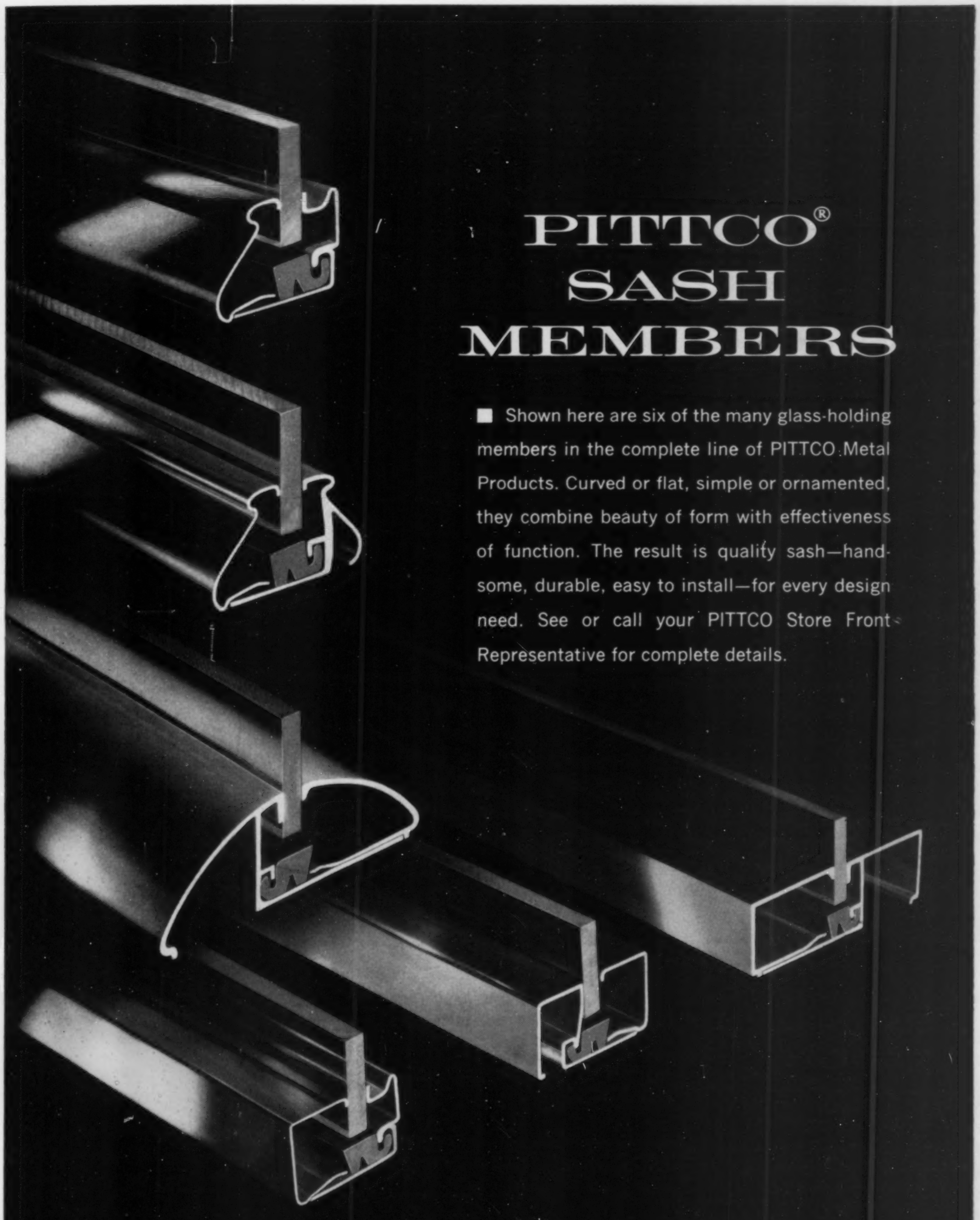

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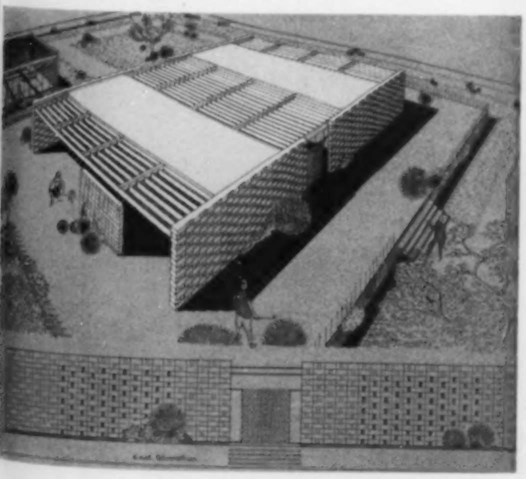
Brief accounts of noteworthy developments

WELDING WITH NOISE

Ultrasonic welding of metals, employing sound waves far beyond the threshold of human hearing, is a completely new metal joining technique developed by Aeroprojects, Inc., West Chester, Pa. Simultaneously squeezing the metals to be welded with a light force of between 10 and 350 lb. and sending ultrasonic vibrations through the squeeze points by means of a 2 kw magnetostrictive transducer, the new technique molecularly welds similar or dissimilar metals, such as aluminum, brass, magnesium and stainless steel, without heat or deformation. The new method thus far has been particularly successful in welding thin metal sheets or wire components and is in the process of pilot plant development on a larger scale.

RISING SOLAR HEAT

Indications are mounting that solar heating is on the verge of being pushed across the line into an economic status that will have to be reckoned with in most regions of the U.S. For the last few years, heating by the sun for any major part of time has been in an indeterminate zone of development where, except in very special situations, its economy has appeared only fair to cloudy. One or two developments may yet be needed, but solar heating, from being a futuristic project in which there was always more than appeared on the surface, now has more and more to meet the eye.



FIRST PRIZE in International Solar House Competition was this design by Peter R. Lee, architectural senior at University of Minnesota. Overhead louvers double as heat collectors in winter, shading devices in summer.

As the result of an international architectural competition sponsored by the Association for Applied Solar Energy of Phoenix, Ariz., and the Phoenix Association of Home Builders, a prize-winning solar house (see picture) is now being erected under the architects' supervision, on a plot outside Phoenix, in a development called Sundown Ranch Estates. It will be ready this spring to serve as a public exhibition and a living laboratory for the sponsors. In the autumn it will be the center of a solar house symposium. A number of similar houses will be built for sale in the area.

Over 100 architectural entries for the Phoenix competition were received from 13 countries. Five prize winners and three honorable mentions were chosen by a jury headed by Pietro Belluschi of Massachusetts Institute of Technology. The winner, though unanimously voted, seemed to some to have come through largely on recondite architectural features that had nothing special to do with solar heating. One thing is certain: his design will be very expensive, much more so than many other contenders. All use heat collecting plates and auxiliary heat pumps.

Of perhaps more significance, because it is in northern latitudes, is Solar House IV, designed by M.I.T.'s School of Architecture, which has had a solar research project going since 1938. This prototype house will also be completed early this year in Lexington, Mass. The new solar house is described as an "unusual dwelling, but not radical in its appearance," except for a south wall that is a flat-plate, glass-covered radiant heat collector, 640 square feet in area and sloping at a 60° angle nearly to the ground. The project was designed to bring solar heating as close to commercial realization as possible at the present stage of technology, providing about 80 per cent of total annual heating requirements from the sun, with the remaining 20 per cent supplied by an auxiliary heating unit at stand-by.

Like the Phoenix houses, Solar House IV will be offered for sale on the open market. This policy was adopted not only to recover a substantial part of the construction costs, but also to sharpen the design problem to meet competitive costs, more or less, in the area. But the M.I.T. group will maintain instrumentation in the house to study its performance.

A number of other solar projects are in the planning stage—one an ambitious, highly advanced project by Marie Telkes, pioneer associate in the M.I.T. program, now at New York University. From these experimental sorties, the industrialization of solar heating moves ever closer. Indeed, at the present rate, solar energy may well outstrip the promises of atomic energy before too long.

AUTOMATIC METRO

Though Europe may be "backward" in some things, it is proving more venturesome than the U.S. in reaching for solutions to its traffic and transport problems. Paris, in addition to being the hatching place for the stillborn but still unique U-drive taxi plan (FORUM, Dec. '57), is also the scene of the first real experimental study of automatic subway travel.

On a strip of the Paris Metro between Porte des Lilas and Saint Gervais, preliminary tests have been made of a "teleguide" system. The train's speed and operation are automatically directed by small electrical impulses taken up by "captors" attached to the underside of the cars and riding on a guide wire strung between the tracks. The wire in turn is hooked in electrically with the signal system. The state of the signal ahead regulates the train, slowing, halting, or accelerating it. Presumably, all this would eventually tie into a central control board. Initially, however, the Metro management plans no more than experimentation on its lines with trains fully manned, the teleguide system serving simply as an added safety device. Many problems remain to be solved, and Metro does not look for any fully automatic operation without trainmen for four or five years. But U.S. transit authorities are still largely at the stage of pronouncing all such schemes "impractical," without even trying them.

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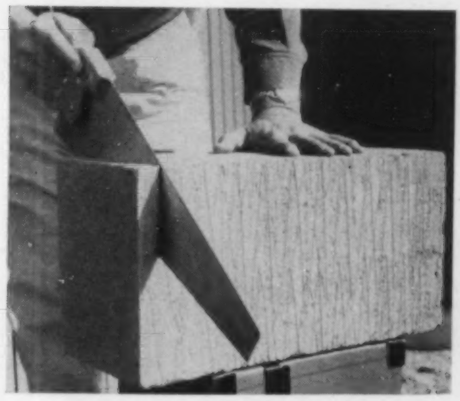
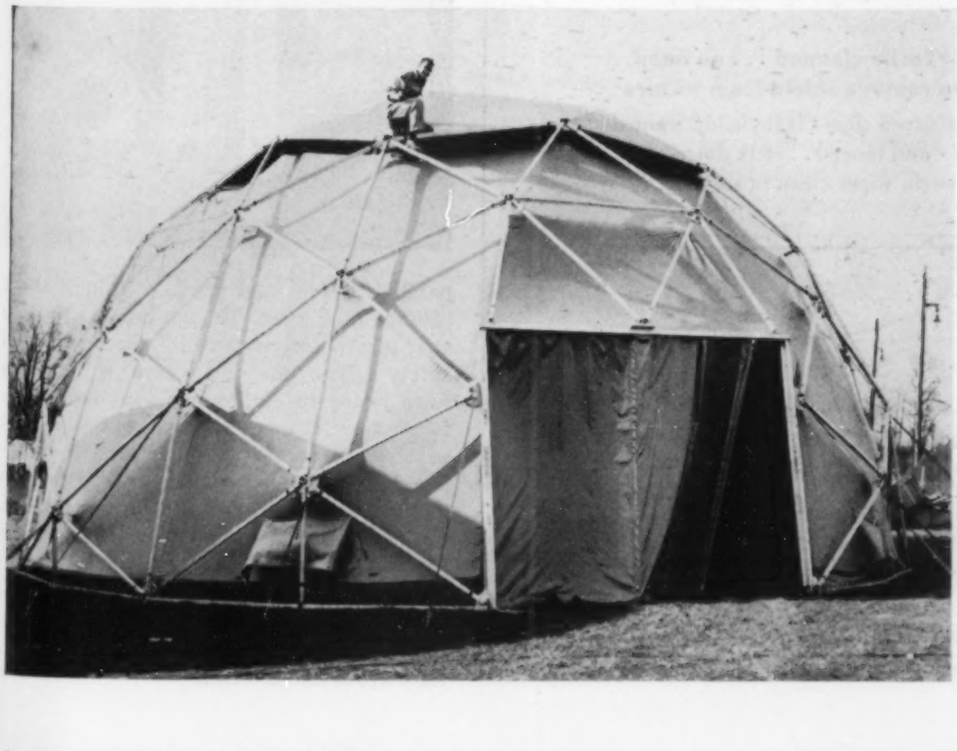


SWEDISH GAS CONCRETE can be sawed or hewn like wood

A remarkably versatile, lightweight concrete, new to this country, is now being manufactured at a new $750,000 plant in Colorado and marketed under the trade name *Durox*. Developed more than 30 years ago in Sweden (Durox International) and said to be used in more than 60 per cent of all current Swedish construction, *Durox* is in essence a precast, cellular (gaseous) concrete produced from a combination of relatively inexpensive materials: limestone, aluminum shale, silica sand, and aluminum powder. In the manufacturing process these ingredients are pulverized, mixed with water, and baked in oiled molds. There an immediate chemical reaction takes place and the aluminum powder, acting as yeast, causes the mixture to rise like bread dough. The mixture attains as much as five times its original volume and, after expansion, cools and hardens. Then a unique system of piano-wire saws is used to cut the molded "cakes" into building blocks, wall panels, insulation slabs, and roof and floor slabs. The resulting product is a strong, lightweight, pure-white construction material with many unusual properties: it can be sawed, cut, nailed, bored, or even planed with ordinary woodworking tools; it is water resistant (25 per cent as absorbant as solid brick) and fire resistant (the manufacturer claims an 8 inch *Durox* wall is fireproof); it offers good insulation against heat and cold; it can be stuccoed, veneered with masonry, painted, or plastered direct; and—being an inorganic, chemically inert material—it is unaffected by rot, termites, or fungi. Because of its low density (from 25 to 45 pounds per cubic foot, compared with 75 to 100 pounds for common brick), *Durox* is economical to ship, and blocks of large dimensions can be handled easily, thereby reducing labor costs, erection time, and mortar consumption. Installed prices: roof and floor slabs 4 to 8 inches thick—and capable of spanning up to 25 feet—about 75 cents per square foot; bearing wall panels 6 to 12 inches thick, about 60 cents; nonbearing partition panels 3 to 5 inches thick, 40 to 45 cents; and nonstructural insulation slabs 2½ to 5 inches thick, 30 to 35 cents.

Manufacturer: U.S. Durox Corp. of Colorado, W. Harvard and South Pecos Sts., Englewood, Col.



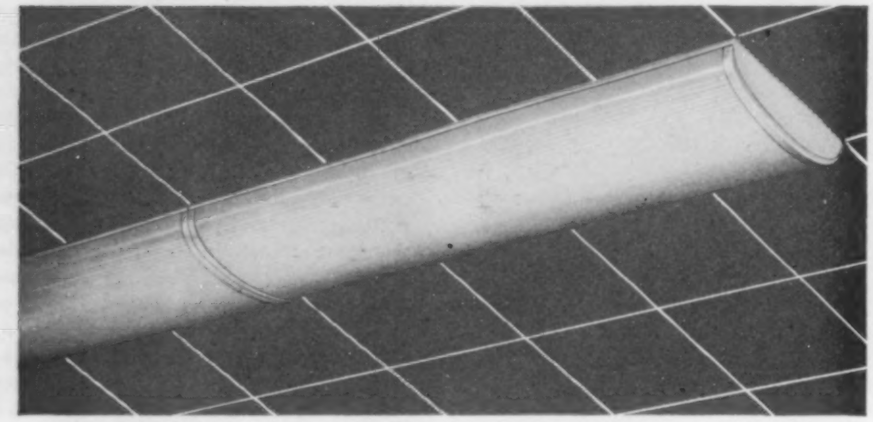
GEODESIC SHELTERS marketed now in a variety of sizes

Heretofore available only to the armed forces, R. Buckminster Fuller's skeletal hemisphere, the Geodesic dome, is now being commercially marketed in diameters ranging from 20 to 114 feet. Easy to assemble and disassemble, Geodesic shelters are low in cost (about $6 per square foot) and light in weight (the 20 foot diameter dome, including plastic fiber skin, weighs just 340 pounds in magnesium, 440 pounds in aluminum). They offer an answer to immediate and even long-range, all-weather housing needs for personnel, equipment, or maintenance. With ordinary care their parts can be stored, shipped, used, and reused for several years. Basic price of a 20-foot dome (including skin) is $2,000; 42 foot, $3,000; 57 foot, $7,500; price for the 114-foot dome has not yet been announced. Prices will vary with dome size, number of doors or windows, type of

continued on p. 138

"Built-In" look...

Surface-Mounted Cost



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shallow, plastic enclosed fixture . . . ideal for low ceiling lighting

Minimum depth consistent with good light distribution and brightness control

With curved shield, unit is only 3¼" at it deepest point . . . yet surface brightness is virtually uniform at all viewing angles and well within acceptable limits for glare-free comfort.

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Shield is of Koppers improved EVENGLO*, a premium-grade polystyrene with built-in resistance to discoloration caused by ultra-violet radiation of fluorescent lamps.

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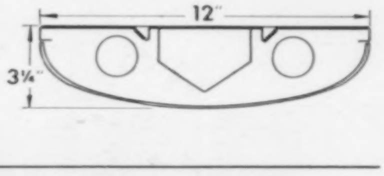
Completely assembled chassis with integral end plates is light-weight, sturdy, easy to handle. Separately cartoned one-piece shield hooks on after installation.

Easily cleaned . . . no need to remove shield from fixture

Curved shield is invisibly framed and hinged . . . lets down at a touch, wipes clean in seconds.



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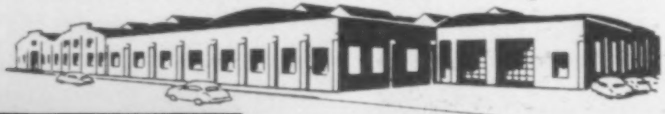

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plastic skin (opaque, transparent, translucent), and quantity ordered. All are available in magnesium or aluminum.

Manufacturer: Magnesium Products of Milwaukee. Plastic skins: Irving Air Chute Inc., 1315 Versailles Rd., Lexington, Ky. and Domestic Film Products, Millersburg, Ohio.

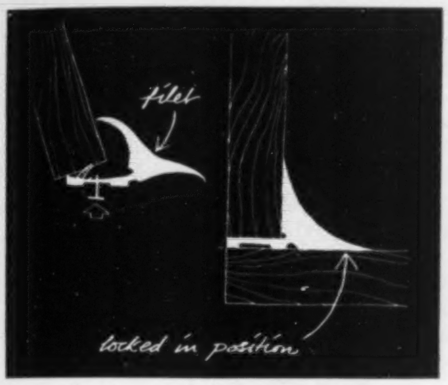
PAINTED SAFETY GLASS
used for stained glass windows

After successfully developing a silk screen technique to print patterns on vinyl film in safety glass (FORUM, May '57), Monsanto Chemical Co.'s Plastics Division has come up with another new—and even more flexible—method for producing inexpensive stained glass windows: hand-painted safety glass. For the first commercial installation, a 240 square foot abstract window unveiled recently at the University of New Hampshire, Artist John Hatch (pictured below) applied his paints directly to ⅛-inch glass. Safety glass was then made by sandwiching three layers of plastic sheeting (polyvinyl butyral) between the painted surface and another ⅛-inch sheet of unpainted glass. Though ordinarily only one plastic interlayer is used to bond safety glass, the two extra thicknesses were added to cushion uneven paint surfaces. Special nonfading paints compatible with the plastic and capable of withstanding high laminating temperatures were also developed by the chemical company. Estimated cost (excluding the artist's fee): $4 per square foot; $6 installed.

Manufacturer: Monsanto Chemical Co., 100 Monsanto Ave., Springfield 2, Mass. *Laminator:* Guardian Glass Co., 1734 W. La Fay, Detroit, Mich.

REUSABLE FILET
forms curved corners in concrete

Rounded corners for poured concrete have been formed in the past with a variety of materials (wood, metal, paper, etc.), all of which were inexpensive, but none of which was flexible or reusable. The new *Green Streak Corner Former* is both. A tough yet resilient polyvinyl plastic fillet that forms 1 inch radius corners on all types of poured concrete piers, columns, and beams, the *Green Streak* sells for about 20 cents a lineal foot (or almost twice as much as wood); but it can be reused up to ten times, thus reducing labor and material costs substantially. Developed first for interior corner molding in Architect Harris Armstrong's McDonnell Aircraft Center, the *Green Streak* is available now in standard 10 foot lengths or in custom lengths of 2,500 feet or more.



Manufacturer: Western Textile Products Co., 2131 Hickory St., St. Louis 4, Mo.

MOVABLE PARTITIONS
use gypsum framed in aluminum

This new partition system—a simple combination of plasterboard panels and aluminum extrusions—can be easily dismantled and reassembled and is low in cost. Installed price of a 9-foot high wall is $18 to $22 a running foot. Boasting a sound reduction of 40 decibels and a one hour fire rating, the gypsum panels (2 feet wide by 2¼ inches thick) consist of two ⅝-inch thick inner sheets faced with

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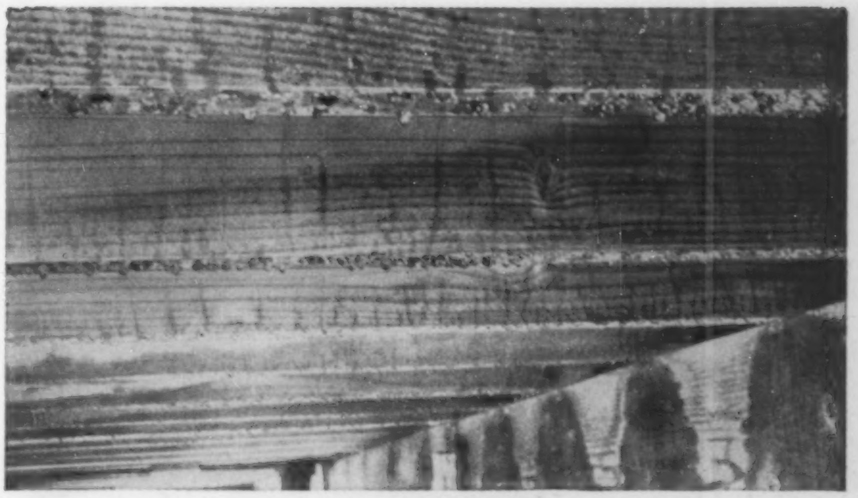
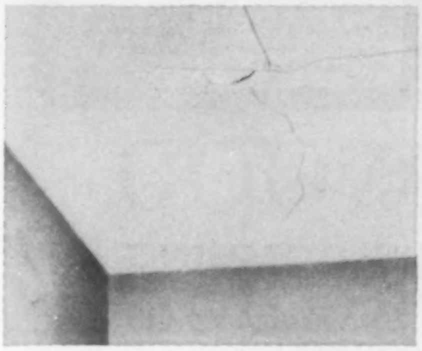
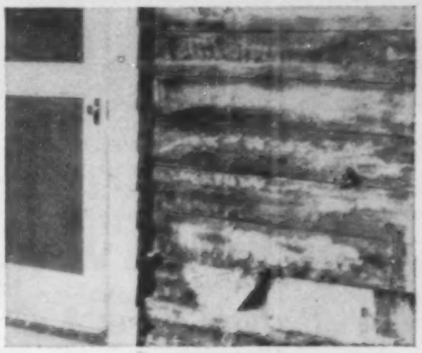


Condensation on floor joists above a crawl space



Cracked plaster ceiling due to condensation on the inside of a flat roof deck



Condensation in the wall caused framing to decay and plaster to crack

Eliminate the ravages of excessive vapor

Rotting walls . . . blistering and peeling paint . . . masonry efflorescence (the white powder that forms on the outside of brick buildings) . . . warping and rotting wood floors and termite problems are just a few of the many evils we have learned to live with . . . all of them are directly or indirectly caused by excessive vapor condensation.

Governmental and academic research has proven that more than 80% of the moisture induced into the home is from the ground source. It makes little difference whether gravel is used under the basement, slab floor or crawl-space . . . or whether the site is on high or low ground, whether it's on a sand dune or a cess pool —somewhere below the structure water exists and vapor will soon rise into the building. The only way to eliminate destructive moisture is in the original construction with the installation of "PREMOULDED MEMBRANE," the industries only TRUE vapor seal. In construction application the 4" x 8" sheets of "PREMOULDED MEMBRANE" are laid directly over the hard tamped grade or fill with a 6" head and side lap that is sealed with Sealtight Catalytic asphalt . . . producing a monalithic vapor seal with mechanically sealed joints, that will expand and contract with the concrete slab above . . . without breaking the bond. "PREMOULDED MEMBRANE" has a permeance rating of only .0066 grains per square foot. We sincerely invite your comparison of "PM" against all other so-called vapor barriers on the market.

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SEALTIGHT® PRODUCTS FOR BETTER CONSTRUCTION
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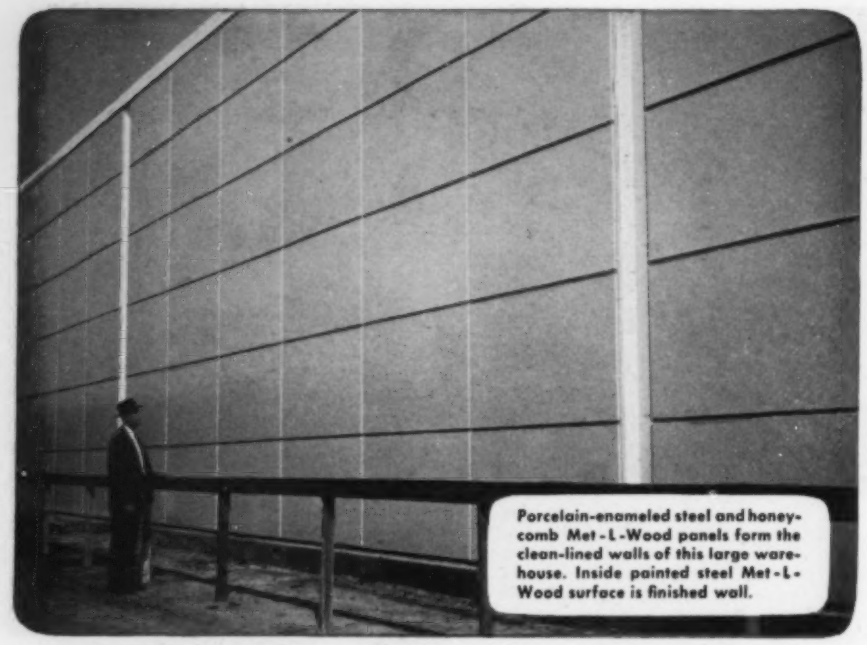

Porcelain-enameled steel and honeycomb Met-L-Wood panels form the clean-lined walls of this large warehouse. Inside painted steel Met-L-Wood surface is finished wall.

MET-L-WOOD

CURTAIN WALLS COMBINE

✳ *Design Leeway* ✳ *Low Finishing Costs*

✳ *Fast Installation* ✳ *Minimum Upkeep*

From architect to occupant, everyone connected with use of Met-L-Wood curtain walls has good reason to be pleased with the results. The porcelain enamel-honeycomb panels shown above are only one combination in a wide variety of surface and core materials available in Met-L-Wood.

All Met-L-Wood curtain wall panels are designed for quick, permanent installation and finishing. Upkeep costs depend on the finish — nil where porcelain enamel or stainless steel is used; occasional painting on bonderized steel or aluminum surfaces.

A new Bulletin—No. 522—describes Met-L-Wood in detail, tells how you can get exactly the type of structural Met-L-Wood to fit your needs. Write for it today: Met-L-Wood Bulletin 522.

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6755 West 65th Street • Chicago 38, Illinois

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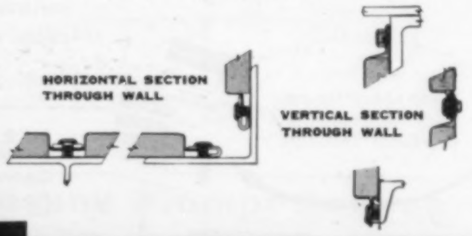
FOR PORCELAIN
ENAMEL PANELS

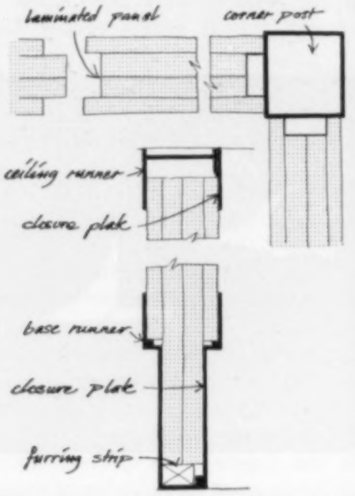


HORIZONTAL SECTION THROUGH WALL
VERTICAL SECTION THROUGH WALL

STRONG
DURABLE
LIGHTWEIGHT

MET-L-WOOD
METAL BONDED TO PLYWOOD

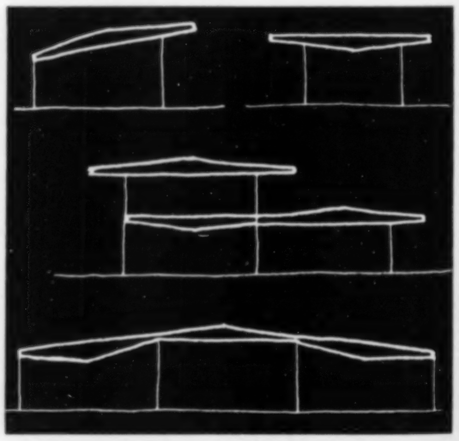
½-inch sheets. The four sheets are laminated on the job. Also designed for custom fitting on the job, the anodized aluminum frames (6603 alloy) are used for base and ceiling closure plates, runners, jambs, mullions, fillers, partition and glazing stops. In addition, the system accommodates glass in a variety of panel sizes.

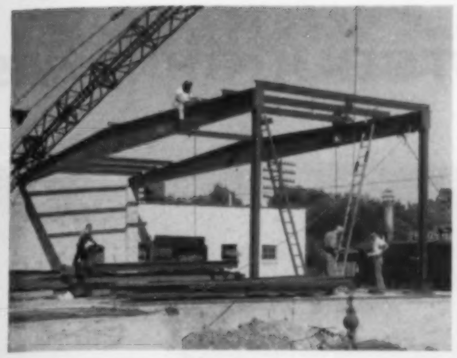


Manufacturer: Vaughn Movable Interior Walls Inc., 11681 San Vincente Blvd., Los Angeles 49, Calif. Gypsum Panels and aluminum frames: Kaiser Aluminum and Chemical Corp., 124 Broadway, Oakland 12, Calif.

SLOPED-BEAM ROOF SYSTEM
offers lower cost design freedom

Marketed to meet the increasing demand for flat or low-profile roofs in schools, warehouses, supermarkets, and multistory buildings, this new tapered beam not only lends itself to innumerable architectural arrangements, but is lighter in weight, though just as strong as rolled milled beams used for equivalent loads. And, according to the manufacturer, the new beams will cut building and material costs as much as 30% (or put the system in about the same price bracket as common wood beam construction). A continuous arc welding machine, which produces lightweight, plated sheet-steel beams with the same load-bearing capacity as heavier beams, is the key to sloped beam economy: less steel in the finished product, lower



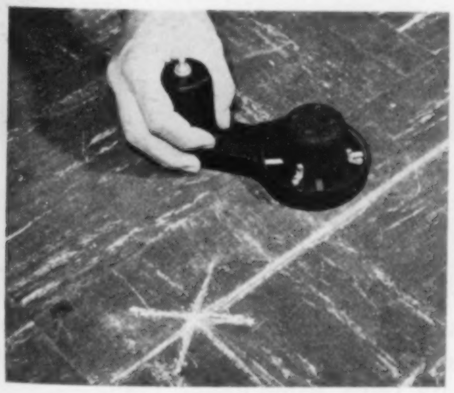


freight and labor costs for handling less tonnage. Unlike wood or milled steel beams which come in standard sizes, sloped beams are shop-fabricated to order in lengths between 25 and 60 feet (including fractions of an inch at no cost increase), thus reducing erection time and eliminating material waste. The beams can be used with metal, gypsum, concrete, wood, and other roof deck materials. Prices range from $145.75 for the 25-foot beam to $729.25 for the 60-footer.

Manufacturer: Steelcraft Manufacturing Co., 9017 Blue Ash Rd., Cincinnati 42, Ohio.

MAGNETIC FINDER
divines buried electric inserts

An electrified underfloor distribution system is, granted, a marvelous boon to construction; but once installed its flexibility is only as good as its findability. When additional floor outlets have to be installed, the existing inserts, already swathed in concrete and topped with tile, have to be uncovered. To locate these underfloor inserts with minimum upheaval, General Electric's Conduit Products Dept. developed a sensitive insert finder with a powerful *Alnico* magnet in the center. Two bisecting hands pivot inside the glass-faced base to indicate the general direction of the insert. Four battery-powered lights recessed at the top of the tool show the operator the insert's precise position by going out when he moves the instrument over dead center. Catalogued as *No. SP-635*, the magnetic insert finder sells for $65, including mahogany carrying case.



Manufacturer: General Electric Co., Construction Materials Div., 1285 Boston Ave., Bridgeport 2, Conn.

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Soundsheet Translucent Acoustical Element for Over-all Lighting Systems successfully combines acoustical and light diffusing properties for the first time!

In working with Soundsheet, architects, engineers and contractors are enjoying new layout and installation freedom. Soundsheet not only supplements other acoustical treatments, but also can be effectively used with most wall-to-wall or area lighting systems now in existence or in the planning stage.

Combines acoustical and lighting properties successfully for the first time • Easy to install • Balanced sound absorption • Washable • Harmonized perfectly with any of today's architectural interior concepts • Quality illumination • Softly diffused lighting free of shadows and reflections at high efficiency • Available in flat or corrugated sheets • U.L. listed.

**The tremendous interest in Soundsheet resulted in thousands of inquiries which far surpassed our expectations — and caused a delay in answering many requests and in filling orders. With administrative and production facilities now expanded to handle the continued demand for Soundsheet, Contrex Company invites you to write for information about Soundsheet's many advantages and how they can benefit you.*

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New office building of Union Federal Savings & makes extensive use of PITTSBURGH GLASS

THIS DISTINCTIVELY DESIGNED building in Baton Rouge, Louisiana, is occupied by the Union Federal Savings & Loan Association. One of the most impressive structures in the South, it utilized Pittsburgh's rough SOLEX® in the spandrel areas, and for greater interior comfort, SOLEX Heat-Absorbing Glare-Reducing Plate Glass was used in the vision areas.

This is the first multi-story glass-clad building in Baton Rouge. The exterior is constructed with Pittsburgh's PITTCO® 82-X system of metal curtain-wall framing. This is a completely integrated system consisting of metal supporting members and glass for the spandrel and vision areas. In addition, the entrances are equipped with HERCULITE® Tempered Plate Glass Doors and the spandrel areas are insulated with PC FOAMGLAS®. Architect: A. Hays Town, Baton Rouge, Louisiana.

Design it better with **PITTSBURGH GLASS**

Loan Association in Baton Rouge, Louisiana, to enhance its advanced architectural design

THIS VIEW shows the first-floor loan section. Here a wall of Pittsburgh Polished Plate Glass brings in the outside with its interesting patio.

ENTRANCES, such as this one to the Union Federal building, are equipped with HERCULITE Doors, set in TUBELITE® Frames. HERCULITE is Polished Plate Glass which undergoes a special tempering process, making it four times stronger than ordinary glass of the same thickness.

Your Sweet's Architectural File contains detailed information on all Pittsburgh Plate Glass Company products . . . Sections 7a, 13e, 16d, 21.

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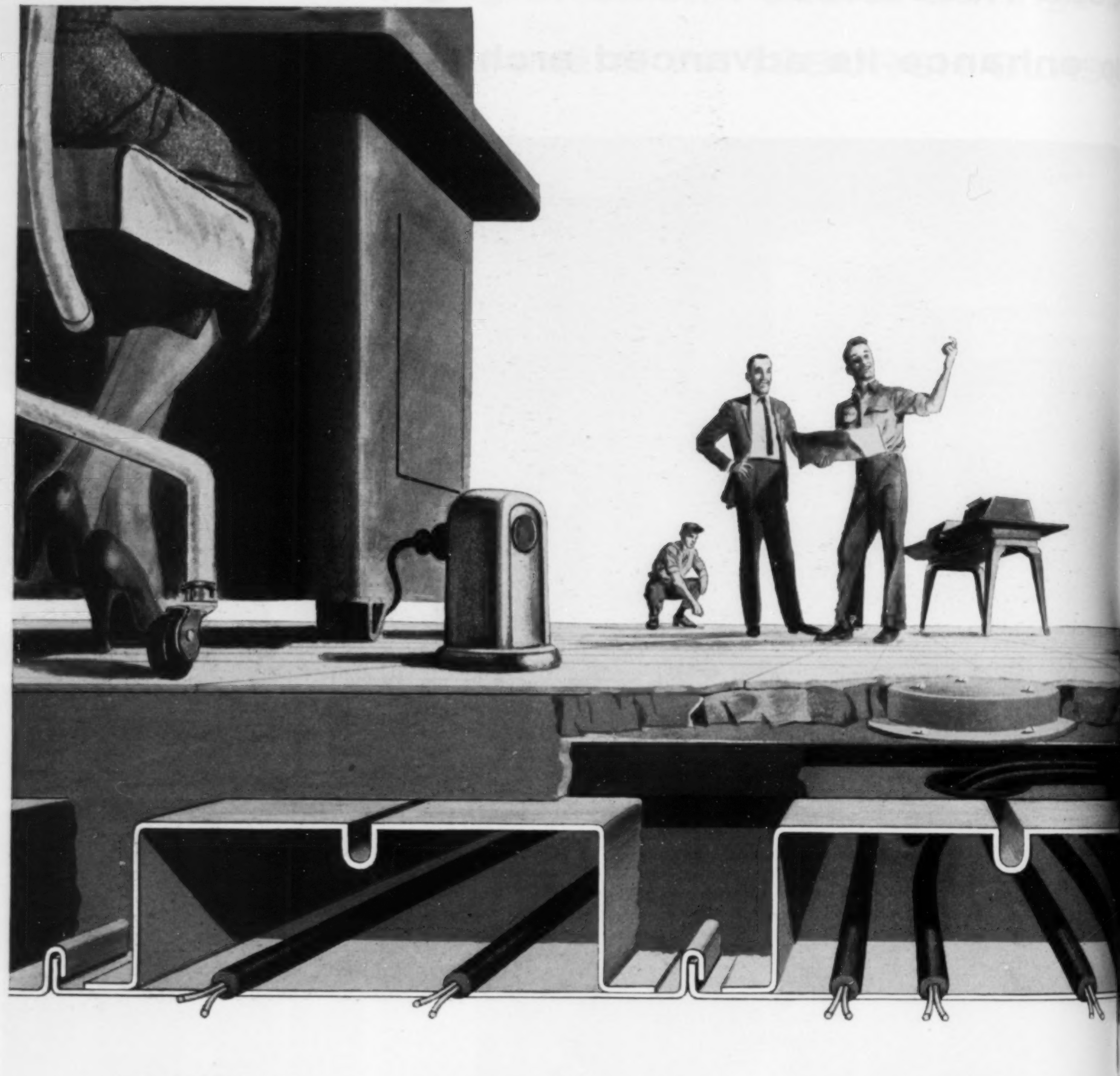
PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED



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the structural floor system with unlimited electrical availability built right in

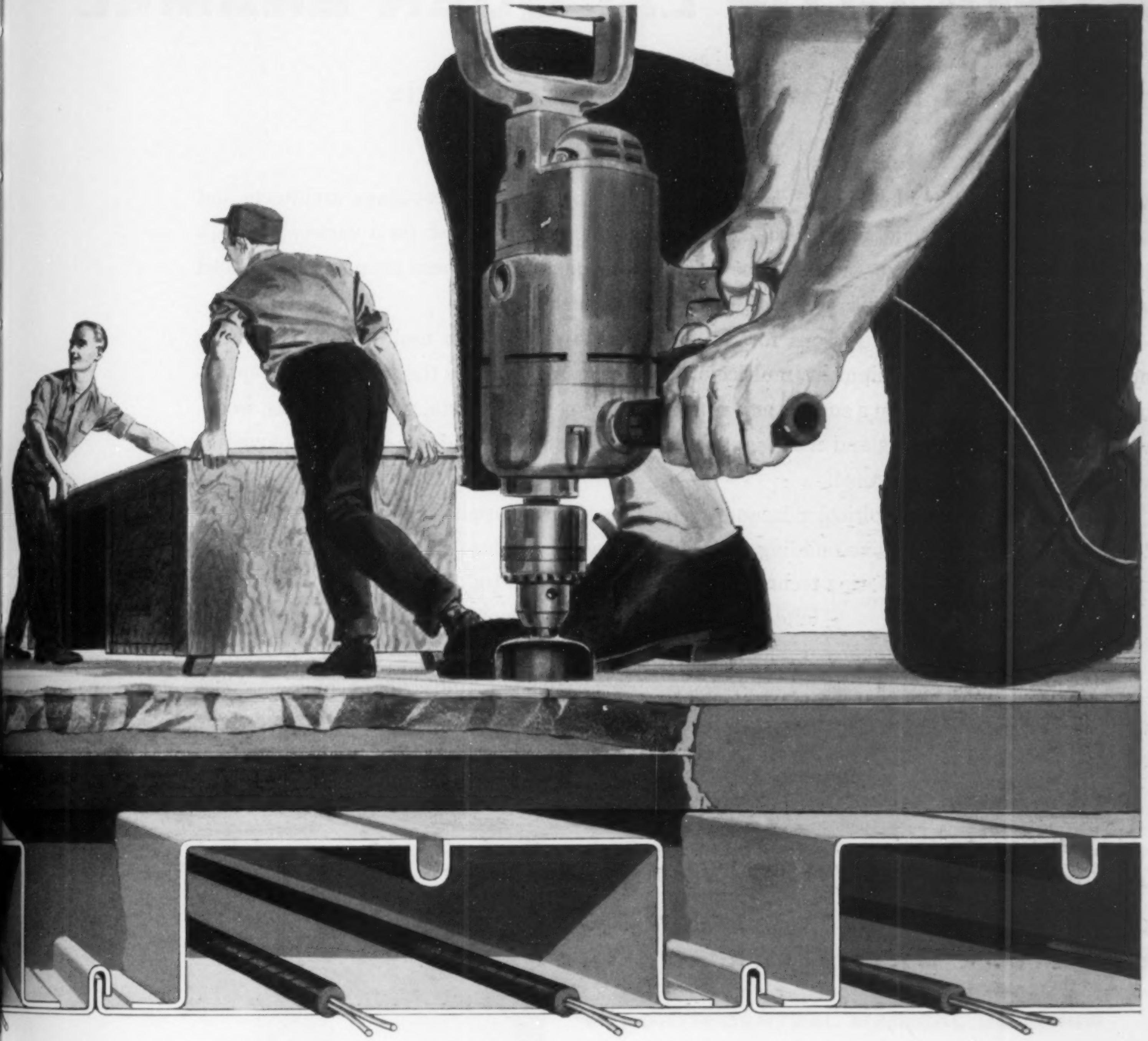
The office building you are now planning is already obsolete without it.

The most important single decision you can make about a new office building is the kind of floor system to be used. Fenestra* Electrifloor† lets you move—or add—electrical outlets, telephones, intercom or office machines *anywhere you want them . . . any time.* It lets you move partitions—change your whole office layout at will.

Whenever you need a new connection, all you do is drill down and pull up the wires—*anywhere in the room.*

Besides giving you easy access to wiring raceways *under every square foot* of floor area, Electrifloor serves as the structural subfloor for your building. Formed of cellular panels of steel, Electrifloor combines great strength with light weight. It saves structural steel and foundation material by cutting the dead weight of the building. It *saves construction time* because the floors go in as the building frame goes up, thus providing working platforms and storage areas for the contractor.

To benefit fully from Electrifloor, your building should be designed around it. Be sure to get in touch



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MULTICOLOR LACQUER ENAMEL

contributes to the new look for Phoenix

What is happening in Phoenix is happening from coast-to-coast—everywhere architects and building managers are finding multicolor lacquer enamel the ideal finish for a variety of tough jobs. The testimonials below indicate that multicolor lacquer enamel users are not only satisfied with the results but are confirmed boosters of this product.

There are many good reasons for the enthusiastic response to multicolor. Using only normal techniques and equipment, multicolor lacquer enamel permits the simultaneous spraying of two or more colors on a surface as a single finishing coat. Concrete, plaster, canvas, wood, wallboard, various plastics and metals all can be given complete and eye-appealing coverage with multicolor lacquer enamel.

Economical to use, multicolor lacquer enamel also can be applied over irregular surfaces to mask imperfections. Unlike building materials can be merged into an attractive and serviceable area when this new coating technique is used. It's durable, too, either as the topcoat over an exterior primer, or for quick, long-lasting, dust- and mar-proof interior decorations.

Hercules Powder Company does not make finished lacquers or coatings of any kind. If, however, you have difficulty securing adequate information on multicolor lacquer enamels, write us and we will be glad to assist.

This advertisement is one of a series prepared to explain the suitability of multicolor lacquer enamels for a wide variety of architectural applications.

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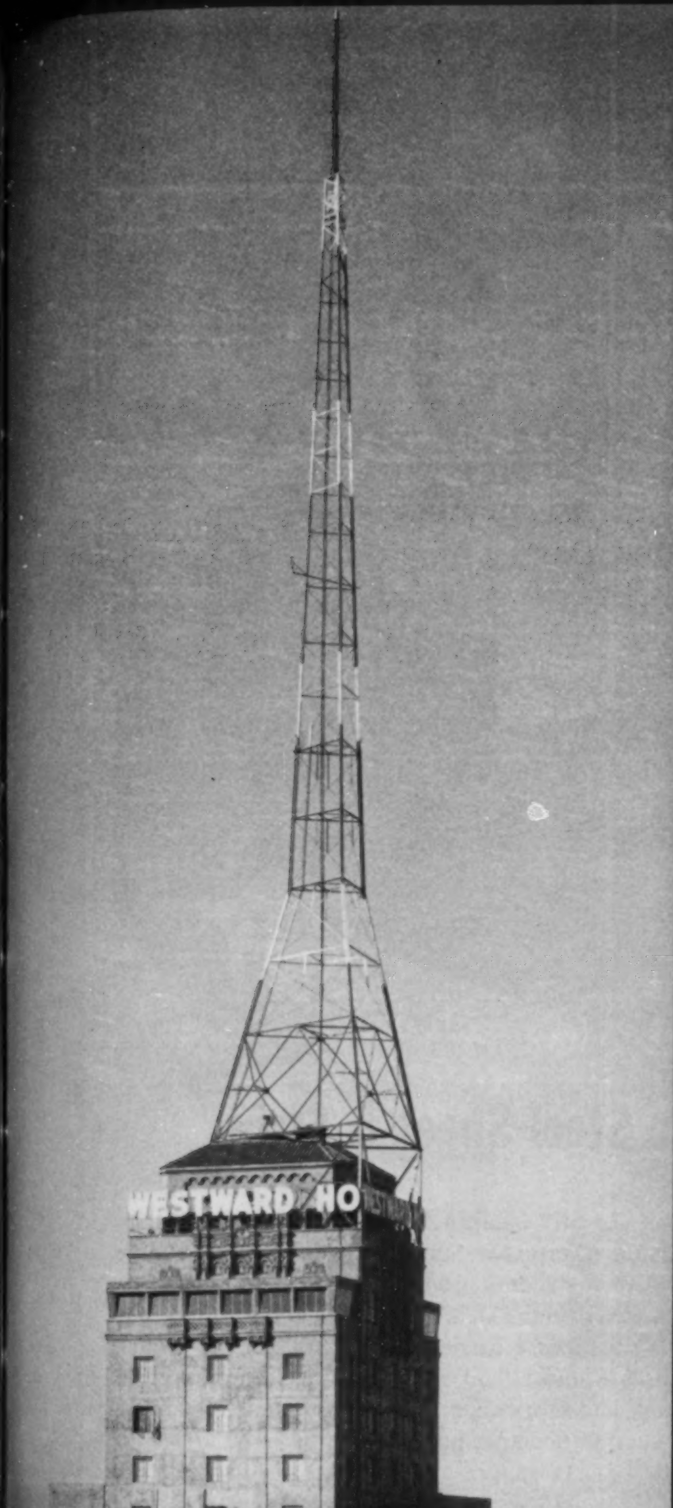
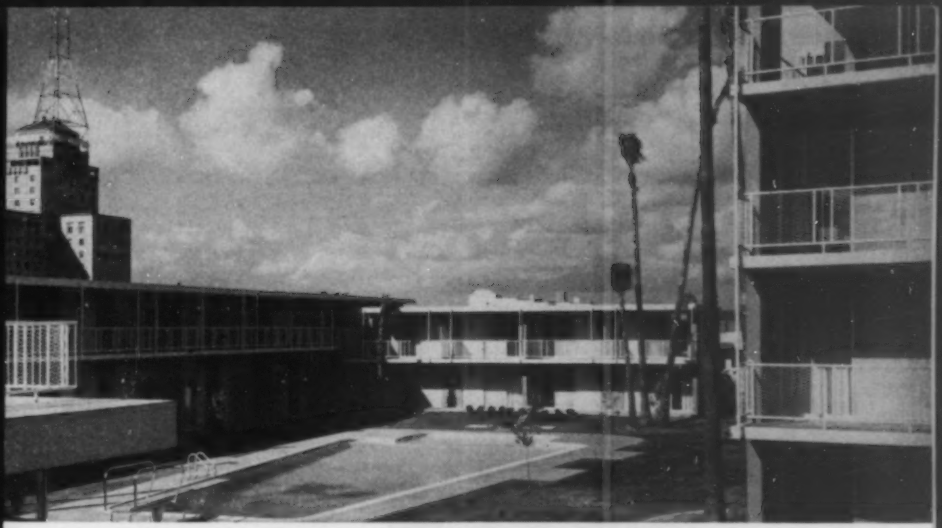
Cellulose Products Department • 900 Market Street, Wilmington 99, Del.
CHEMICAL MATERIALS FOR INDUSTRY

CL58-1

PHOENIX TOWERS—"The accent is on quality at Phoenix Towers and to our way of thinking true quality must combine a distinctive, rich appearance with the ability to wear well. We selected multicolor lacquer after consultation with architects, builders and painters because it measures up to the requirements in all respects."
Ralph W. Applegate, Applegate Realty & Investment Co.

HIWAY HOUSE—"A motor hotel—especially in Arizona—must absorb a good deal of wear and tear from brilliant sunshine outside and guests and the staff inside. That's why we specified multicolor lacquer. Multicolor doesn't show marks readily, seldom needs cleaning, and always has a fresh 'just like new' appearance."
Joe N. Simmons, Manager, Hiway House





SAHARA MOTOR HOTEL—"We are convinced that multicolor lacquer is a practical wall paint. Shoe polish and scuff marks can easily be scrubbed off the bottom area of doors. Bathroom door finishes do not deteriorate from steam and moisture. And if 'touching up' is needed a freshly applied spot blends perfectly."

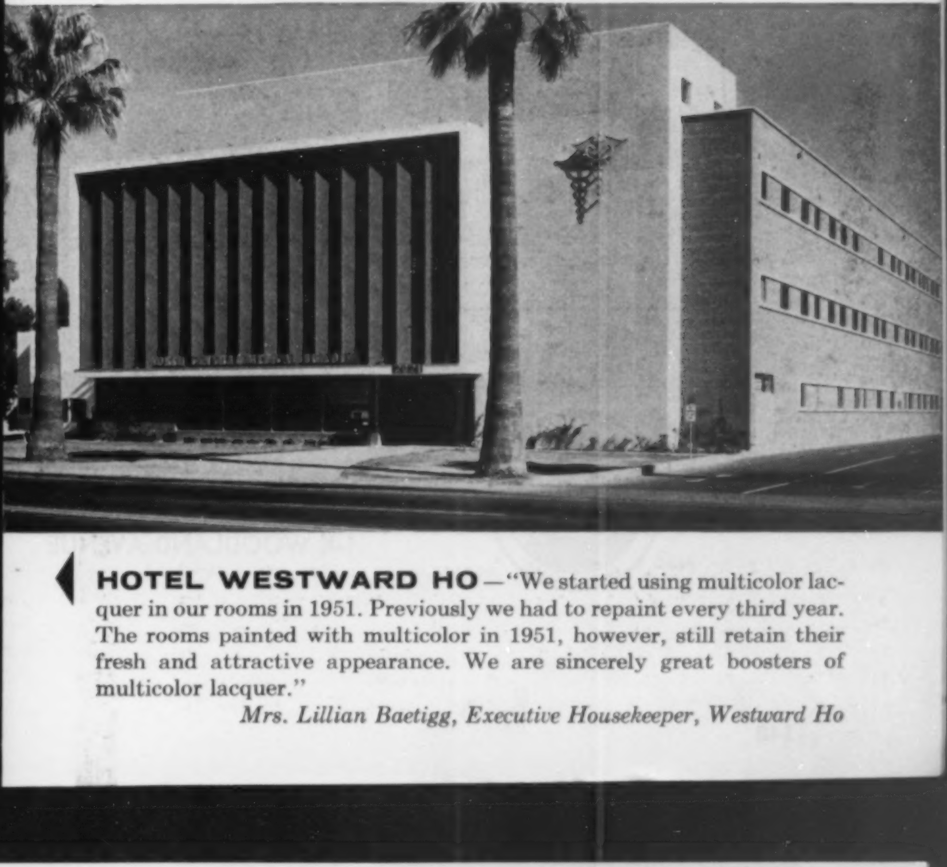
John Lann, Manager, Sahara Motor Hotel

3424
CENTRAL PLAZA BUILDING

CENTRAL PLAZA BUILDING—"For years we attempted to find a material which would withstand the wear and tear of the elements and the other destructive treatment which attack exterior metal railings and exposed wall and ceiling areas in our patio type office buildings. (Central Plaza Building, above, and North Central Medical Building, below, are typical examples.) Multicolor lacquer performs so well that we are specifying it in our new two million dollar office building."

David H. Murdock, David H. Murdock Development Co.

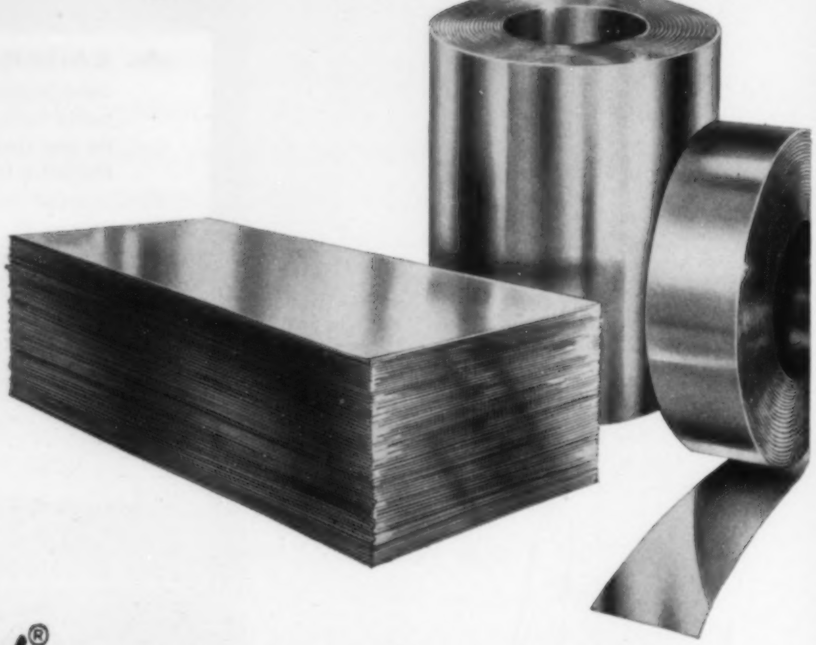
NORTH CENTRAL MEDICAL BUILDING



HOTEL WESTWARD HO—"We started using multicolor lacquer in our rooms in 1951. Previously we had to repaint every third year. The rooms painted with multicolor in 1951, however, still retain their fresh and attractive appearance. We are sincerely great boosters of multicolor lacquer."

Mrs. Lillian Baetigg, Executive Housekeeper, Westward Ho

Wherever you are you get *quick personal service*



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GRADES:	201, 202, 301, 302, 304, 305, 316, 321, 347, 403, 410, 430 and Micro-Mach (special extra-high-tensile aircraft grade)	

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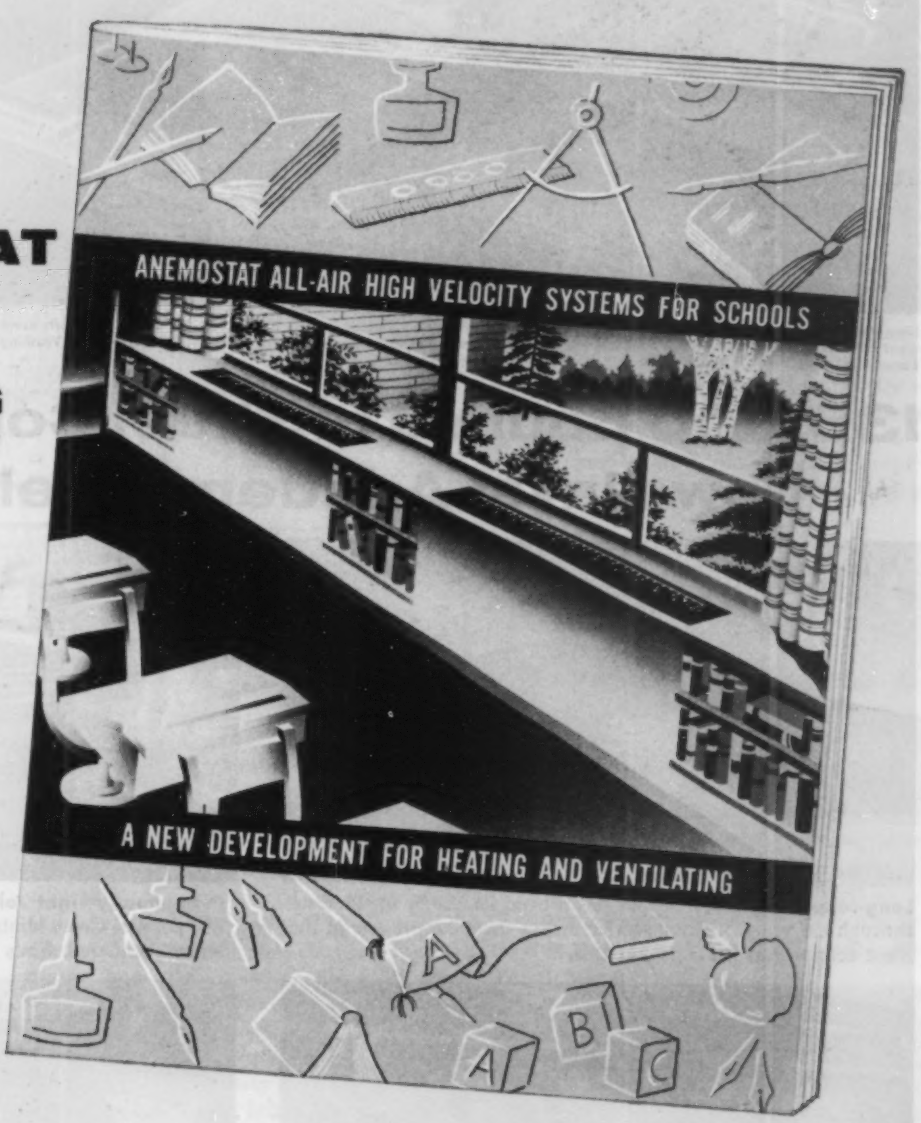
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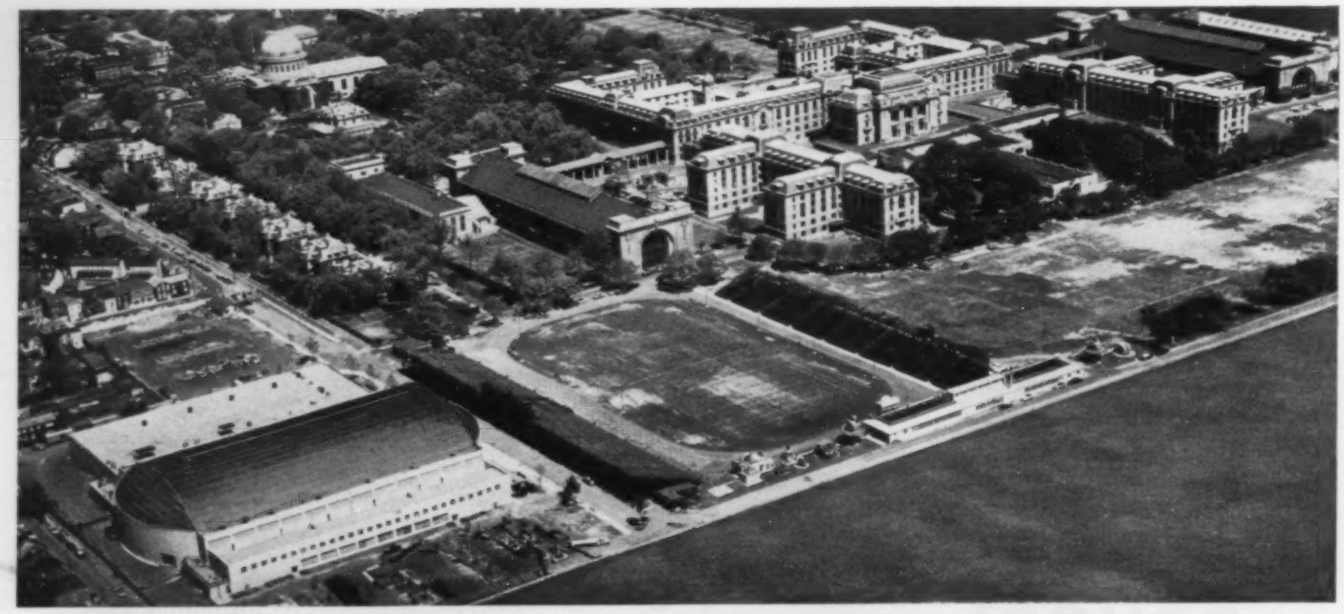
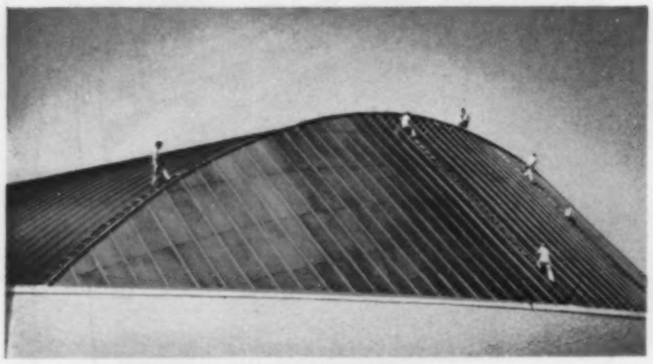


New Field House (lower left) at U. S. Naval Academy, Annapolis, offers an indoor area 200' by 370' by 70' high for sports events and practice. Its huge roof is covered with Anaconda sheet copper, installed by Overly Manufacturing Co., Greensburg, Penna. General Contractor: Wm. E. Cramer Co., Washington, D. C. Architects: Harbeson, Hough, Livingston & Larson; also Von Storch, Evans & Burkavage, both of Philadelphia, Penna.

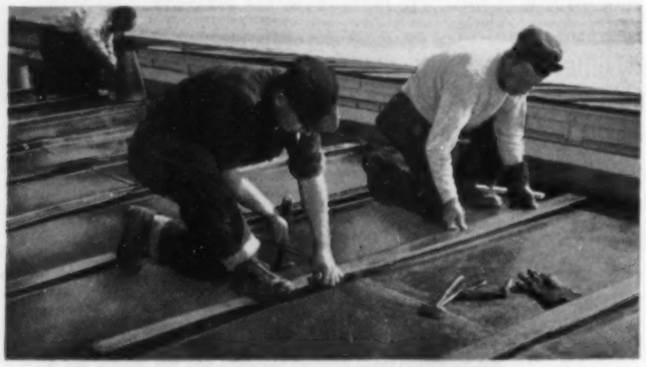
136,000 pounds of Sheet Copper protect new Naval Academy Field House



Long-range economy. Copper has proved its ability to stand up through the years. Its long service makes sheet copper one of the most economical roofing materials.

Permanently Tight Joints. No other commercial metal solders like copper. Cross joints in the roof pans at the crown are clinch locked, soldered. Ends of pans are pre-tinned.

Minimum maintenance. Copper, in aging, acquires an attractive patina; it requires no special care or attention. A copper roof is lasting, weather-tight . . . needs no expensive maintenance.



Freedom of design. Copper is so easy to bend, form, and fasten that it can be adapted easily to any type of building. Techniques have been developed to meet modern structural problems.

FREE BOOK. "Modern Sheet Copper Practices," published by The American Brass Company, was designed for the architect, specification writer, and sheet metal contractor. It is a practical guide, with clear, brief suggestions and drawings to help meet everyday problems. For your copy, address: The American Brass Company, Waterbury 20, Conn. 5729

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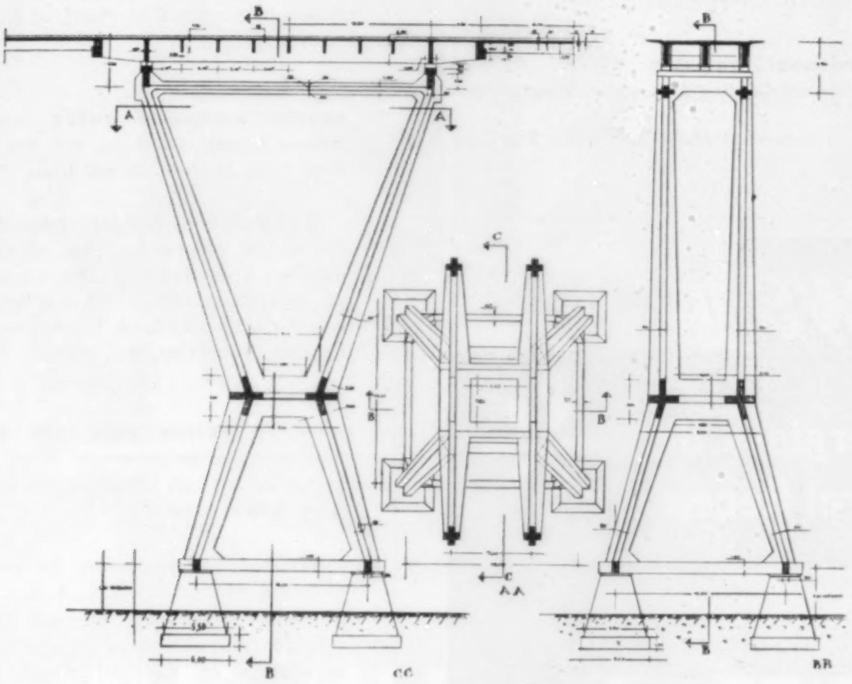
Books

. . . Nervi structures . . . row houses . . . Ralph Walker



THE WORKS OF PIER LUIGI NERVI. By Ernesto Rogers. Published by Frederick A. Praeger, 15 W. 47th St., New York 36, N. Y. 141 pp. 11" x 9". $10

Appropriately, the content of this book is sharply graphic. Like the strong design for a bridge trestle shown above, the buildings and structures which are the life work of the Italian master of concrete and structure are introduced in photographs and sketches. They are then thoroughly documented with well-chosen sections, plans, and details—a number of which have appeared in FORUM over the years.

Despite the wide variety of the work (from oil tanks to office towers) and the corresponding diversity of structural solutions, the reader is left with the impression of a remarkable singleness of purpose.

Nervi himself, in a succinct two-page preface, confirms the impression: "My belief in the inherent esthetic force of a good structural solution was never shaken. Never did I find a good building, old or new, which departed from this principle. Therefore I maintain that a good structural organism is essential to good architecture."

In a time when anything can be built, Nervi's forms can be superficially applied to almost any architectural problem. Undoubtedly, this book will be helpful to those who would do so. But those who would look further and deeper will find the story of a "patient and passionate" search for architecture by a transcendent structural engineer.

THE FLY IN THE AMBER. By Ralph Walker. Published by Henahan House, 461 Eighth Ave., New York, N.Y. 160 pp. 6¼" x 9¾". Illus. Privately distributed

Ralph Walker has been called "The Lost Leader of American Architecture." Lost both because of the many younger architects who do not heed his guidance and because of his own unwillingness to explore the new ways that have opened up within this century.

Lost, perhaps. But ever eloquent and ever passionate, with a grand, almost Churchillian, air.

This book, of which 500 copies have been made available, is a collection of his excerpted speeches and writings, 1950-57. It is handsomely printed, carefully edited, and never obscure. Take, for example, his explanation of the title: "Like a fly in the amber, man, poor fool, is imprisoned within his own dogma of steel and glass."

EASTWICK NEW HOUSE STUDY. Published by Redevelopment Authority of the City of Philadelphia. 66 pp. 14¼" x 16". Illus. $5

A more effective, complete case for row houses could not be made.

Getting down to the specifics with virtually no ballyhoo, Philadelphia's Redevelopment Authority suggests that this and this and this scheme be considered by any builder who might want to take on a share of the Eastwick Redevelopment Project. Disadvantages as well as advantages of each row-house plan are frankly discussed, codes analyzed, costs squarely estimated.

Plain-spoken though they may be, the suggestions have enough architectural imagination and economic validity to satisfy Burnham himself. A summary of them was made in the May FORUM.

Architects Wright, Andrade & Amenta and everyone associated with the undertaking deserve the thanks of all urban Americans. They have made living in the city look like a possibility for human beings as well as for automobiles.

BUILDING THE NEW CHURCH. By William S. Clark. Published by The Religious Publishing Co., Jenkintown, Pa. 68 pp. 5¼" x 8½". Illus.

This book, scarcely more than a pamphlet, should do more to get church building committees up off their seats and out into the visual world than any number of edifying art lectures. Author Clark, editor

continued on p. 152

Books
cont'd

of *Your Church,* apparently has had enough dealings with clergymen, committees, and congregations across the country to know the quickest way to get these people to see the point. And the point, of course, is that church building is worship in architecture, it is a "liturgical act of homage and offering to Almighty God."

It is also, to be sure, a fairly confused process at times, with many practical barriers on the way. Most of these barriers are mentioned in the book, with simple detours suggested. An excellent little guide.

TECHNICAL PUBLICATIONS

A selection of new handbooks, textbooks, technical reports, brochures and commercial leaflets, noteworthy for their information content or pictorial format or both

SCHOOL BUILDING COSTS. Published by Owens-Corning Fiberglass, Toledo, Ohio. 57 pp.

A new study (by Wayne Farland Koppes, B.A. and John Hancock Callender, A.I.A.) of the performance and economic values of thermal insulation in school buildings. Included are 14 five-color graphs detailing cost and comfort comparisons for various roof, ceiling and wall systems, plus 28 sketches of recommended construction and a gate-fold chart of heating and cooling costs.

REVERE ALUMINUM SHEET. Published by Revere Copper and Brass, Inc., 230 Park Ave., New York 17, N.Y. 28 pp. Illus.

A handsome booklet (thumb indexed for quick reference) that offers a well-detailed breakdown on this company's line of aluminum sheet: its applications, nomenclature, standard tolerances, weights, typical properties, and limits.

HOW TO DESIGN POLE-TYPE BUILDINGS. Published by the American Wood Preservers Institute, 111 W. Washington St., Chicago 2, Ill. 67 pp. $1.50

Written for engineers by an engineer (Donald Patterson, B.E., C.E.), this comprehensive working manual presents a concise compilation of structural and design data on uses of round and sawn timbers in warehouses, barns, service sheds, and other buildings. Fact charts, accompanying text, and 17 line drawings of construction details show how to compute live, dead, and wind loads and stresses for every structural member of a proposed pole-type building and enable users to make quick calculations of required pole embedment.

METAL GRATING HANDBOOK. Published by the Metal Grating Institute, 1 Gateway Center, Pittsburgh 22, Pa. 32 pp. Illus. $1

Not a manufacturers' catalogue, but a standardized presentation of the use and application of all types of metal grating. Schematic drawings, load-bearing tables, installation photographs, as well as complete specifications and a glossary of technical terms used throughout the metal grating industry make this a practical reference guide for architects, engineers, and builders.

PORCELAIN ENAMEL IN ARCHITECTURE. Part 1: Veneer-type construction. Part 2: Curtain wall construction. Published by the Porcelain Enamel Institute, Architectural Div., 1145 19th St., N.W., Washington, D.C. 23 pp. and 27 pp. Illus.

These two brochures form a design manual in which are contained technical information, design data and examples of use for the two main architectural applications of porcelain materials.

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One-Piece Fiberglass Unit with Two Integral Receptors *

HAWS again answers the need for more efficient, and attractive deck-type facilities . . . with this one-piece fiberglass Series 2700, complete with **two integral receptors.*** Note the complete absence of rims, cracks, joints—no accumulation of water or grime. This ample 6-foot unit is easily attached to a prepared cabinet frame.

VERSATILITY! HAWS raised, shielded, anti-squirt bubbler is mounted on smaller receptor at right. Larger central receptor may have a pantry goose-neck faucet, **or** a hot and cold double compression-type faucet. All fixtures are VANDAL PROOF mounted.

COLOR! Choose from five decorator colors and white—colors permanently bonded to fiberglass. And the finish is acid and alkali resistant for lifetime durability.

*** Particularly ideal for satisfying certain local code requirements (i.e. N. Y. State, Conn., Detroit) which specify drinking fountain separate from pantry receptor. FREE DETAIL SHEETS sent at your request. Also Series 2500—similar design with both fixtures on single receptor.**

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☐ Complete new HAWS Catalog.

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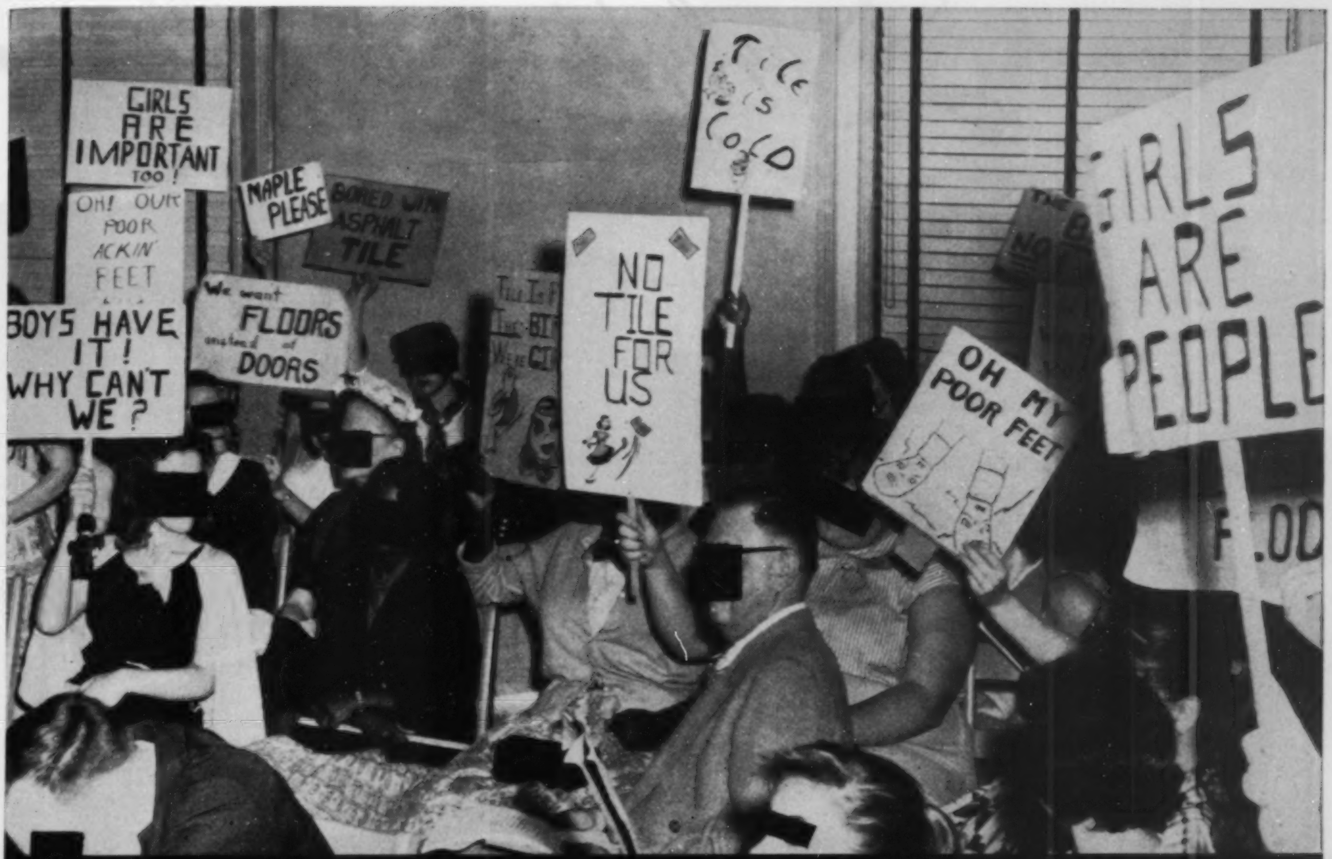
GIRLS ARE IMPORTANT TOO!
OH! OUR POOR ACKIN' FEET
BOYS HAVE IT! WHY CAN'T WE?
MAPLE PLEASE
BORED WITH ASPHALT TILE
We want FLOORS instead of DOORS
Tile is Cold
NO TILE FOR US
OH MY POOR FEET
GIRLS ARE PEOPLE
FLOO

WE WANT MAPLE!

"Floors instead of doors," "The boys have it, why can't we?" demand the placards. "We want maple!" shout the high school girls in East St. Louis, Illinois. They march en masse into the school board meeting to insist on maple flooring for the girls' gymnasium in the new East St. Louis Senior High School. They explain to the board members their reasons for wanting maple. "Substitute floors hurt their feet," they say, "and provide a poor surface for games." For the small extra cost, they feel maple flooring is well worth it.

The board listens to their plea and considers, weighs the advantages of maple against substitute flooring . . . and then changes the plans. The girls win the day.

They argued so strongly because they *play* in gymnasiums and *know* there's a lot of difference in quality between maple flooring and substitutes. And the board had to agree that the big difference in quality was worth the small difference in cost.

Don't you?

East St. Louis Journal

Photo courtesy East St. Louis Journal. Faces obscured in accordance with state privacy laws.

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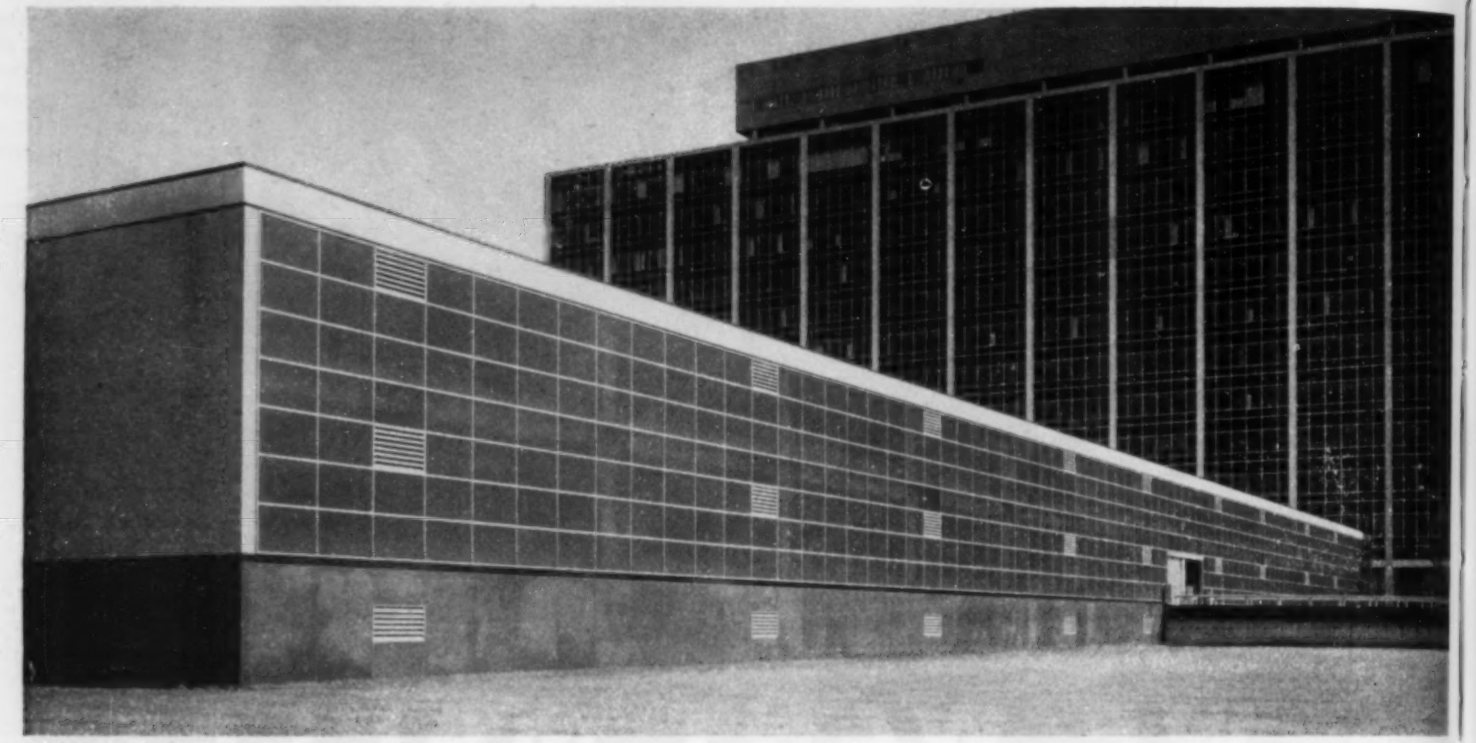

Glare reduced Coolite glass achieves high levels of illumination without heat and glare for Ford Motor Company Garage, Dearborn, Michigan.
Glazier: Pittsburgh Plate Glass Co., Detroit

Coolite, Heat Absorbing Glass, glare reduced on the pattern side, provides ideal daylighting for Johnson Motors, Waukegan, Illinois. Architect: Shaw, Metz & Dolio. Contractor: Campbell, Laurie & Lautermilch. Glazier: Waukegan Glass Co.

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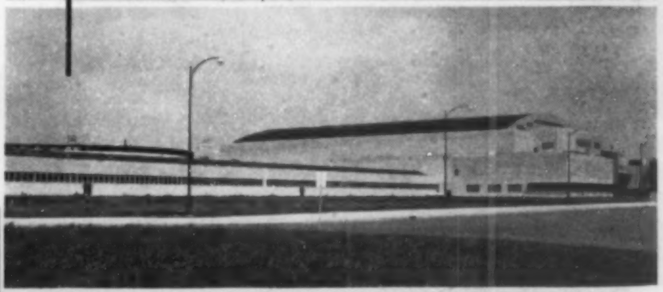
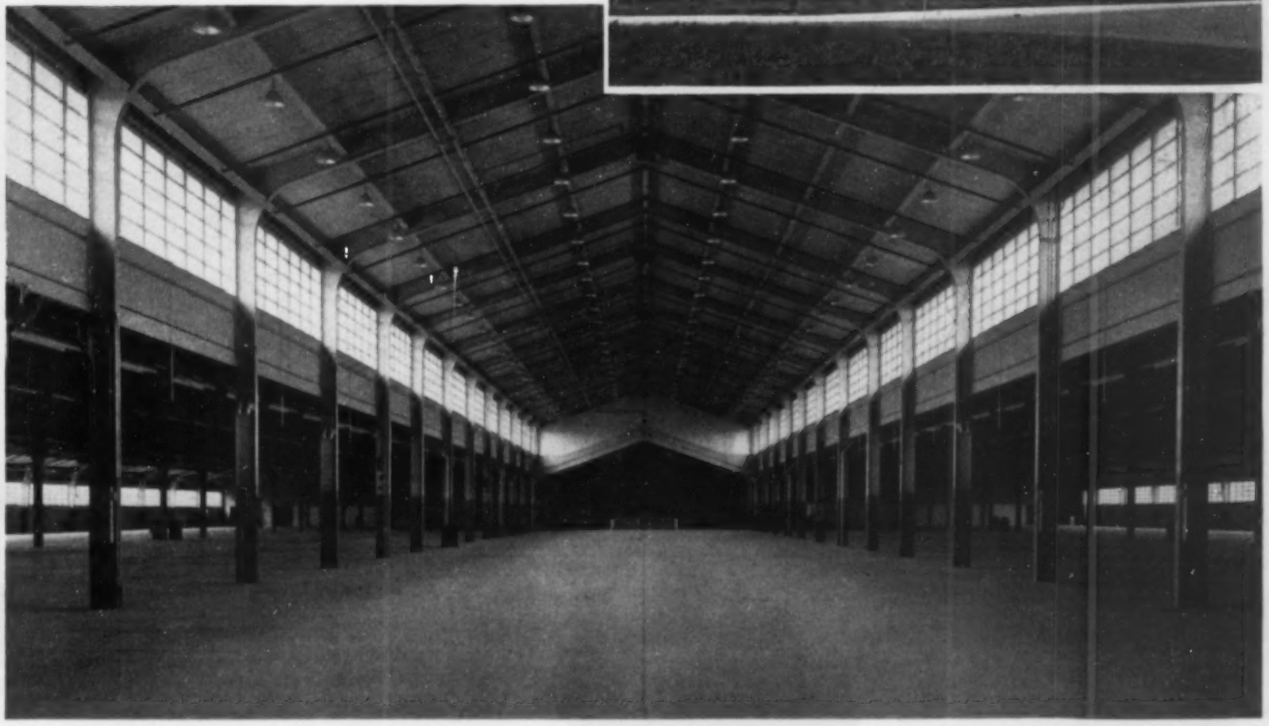
Today's leading architects are taking fullest advantage of translucent glass to achieve interesting, highly functional structures that provide high levels of low cost, natural illumination. Specify glass by Mississippi. Available in a wide range of patterns and surface finishes to solve any daylighting requirement.

Coolite, Heat Absorbing glass, glare reduced, installed in the Twin Disc Clutch Company, Racine, Wisconsin, floods work areas with conditioned daylight . . . absorbs up to 50% of unwanted solar heat. Glazier: Pittsburgh Plate Glass Co.

35,000 sq. ft. of Smooth Rough glass in the Kentucky Fair and Exposition Center, Louisville, Ky., brightens entire interior.
Architect: Fred Elswick and Associates of Louisville
Photo by: Royal Photo Co.





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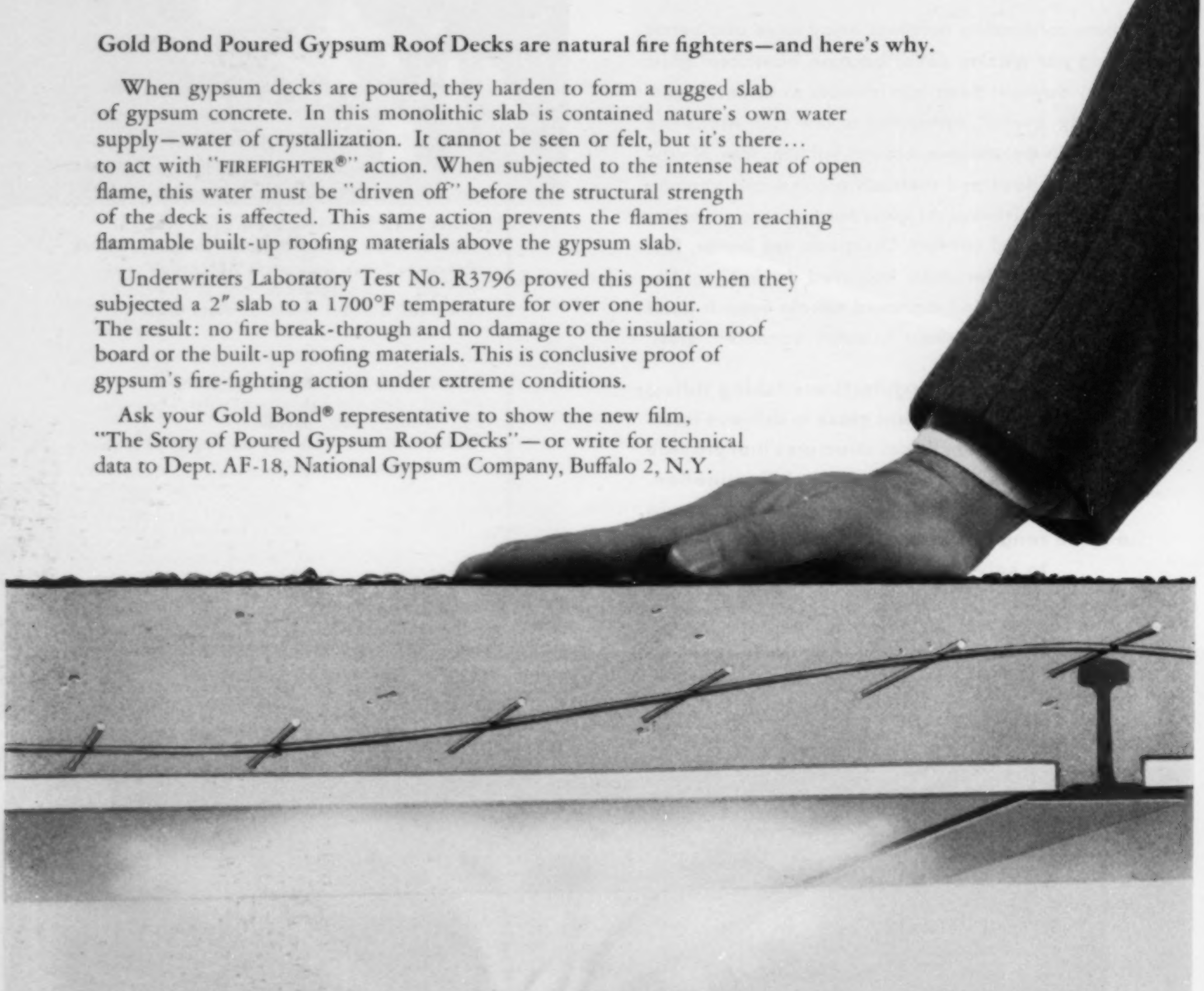

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BUILDING PRODUCTS
NATIONAL GYPSUM COMPANY

Excerpts

What other people are saying

THE PROFESSION'S ANSWER

A year ago in FORUM *(Feb. '57) Mary Mix Foley opened a debate on "The Debacle of Popular Taste" which threw some fairly pointed challenges at U.S. architects. In the October* Report *of the AIA's Baltimore Chapter, Ian MacCallum wondered why no one had ventured a counterattack*

The silence we have accorded Mrs. Foley is very loud and disturbing. In fairness to such a serious appeal, we should answer her.

Does she know her architect well, or is she calling on a mythical being, in desperation? If in the past the profession has helped to guide popular taste, which is by no means certain, it has done so indirectly by isolated example. In its present form, the profession has existed only in an era of declining taste. Its increasing inclination toward business rather than art is coincident with the acceleration of a decline in popular taste. The architect is the willing victim of the same causes which underlie the decline.

Before the profession could become a minority qualified to lead against ugliness, we would have to examine ourselves without mercy; as we stand, it is not at all likely that we will do so. Consider our dislike of criticism of one another, a dislike based on two excuses. We think, as our brother professions seem to think, that by refraining from criticism we protect one another and so present a united front. To a lesser degree we refrain because true criticism is an art in itself requiring detachment, courage, perspective, and a fine sense of language. Of these, we lack courage most of all. These excuses, which keep us from examining ourselves, are clear enough to a populace which instinctively suspects us of something less than perfection because we resort to dodges in the name of ethics.

There are among us, however, many individuals who have the three necessary marks to qualify them for the kind of leadership Mrs. Foley must have in mind. These three are a dedicated love of beauty, a developed sense of values, and an ability to communicate. Or, in plain words, the attributes of an artist rather than those of a businessman, a roundly educated man rather than a specialist, a man with a command of basic English rather than a jargonist. These are the architects who can help most, not collectively as members of a professional group but as individuals.

DEVELOPMENT'S ACHILLES' HEEL

The "land bank for urban redevelopment," another FORUM *suggestion, was recently reviewed by William L. Slayton, vice president for Planning and Redevelopment of Webb & Knapp, writing in the October issue of* Redevelopment

It is not essential that preparation of a city's redevelopment plan precede acquisition, relocation, and demolition—both can take place at the same time. Acquisition does not have to wait for preparation and approval of the redevelopment plan. The public purpose is slum clearance—redevelopment is incidental.

The importance of the separation of these two functions has become more and more evident as our experience with redevelopment projects has developed. We have learned that from inception to disposition or construction a very long time can elapse and that too often it is a *very, very* long time. The length of the process has become urban redevelopment's Achilles' heel. Obviously, if the two time-consuming functions could be taken apart and worked on simultaneously, then the process would be only as long as the longer of the two functions—not a sum of the time it takes to do each.

The proposal that these two functions be carried out simultaneously has been dubbed by some as a "land bank for urban redevelopment." The term "land bank," which is based on a broader concept than the idea of acquisition prior to redevelopment plan approval, seems to have had its genesis in a FORUM round table (Jan. '56).

Basically, the proposal is that the acquisition and clearance of an area proceed immediately upon the decision that the area is deteriorated or deteriorating, so that acquisition and clearance can take place at the same time the redevelopment plan is being prepared. The proposal is that as soon as adequate data have been collected to demonstrate the slum characteristic of an area and as soon as the appropriate governing body or bodies have approved the area as a slum area, the redevelopment agency should commence acquisition, relocation, and clearance operations with loan funds from the Urban Renewal Administration. During this period, the redevelopment agency would develop its redevelopment plan and submit it for approval to the necessary legislative and administrative bodies. Acquisition would not have to wait for redevelopment plan approval.

continued on p. 159

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Basic 2' 2", 3' 2", 4' 2" and 5' 2" units mount directly on wall. Interlocking add-on sections make racks of longer lengths and greater capacity.

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PROJECT: *1958—*
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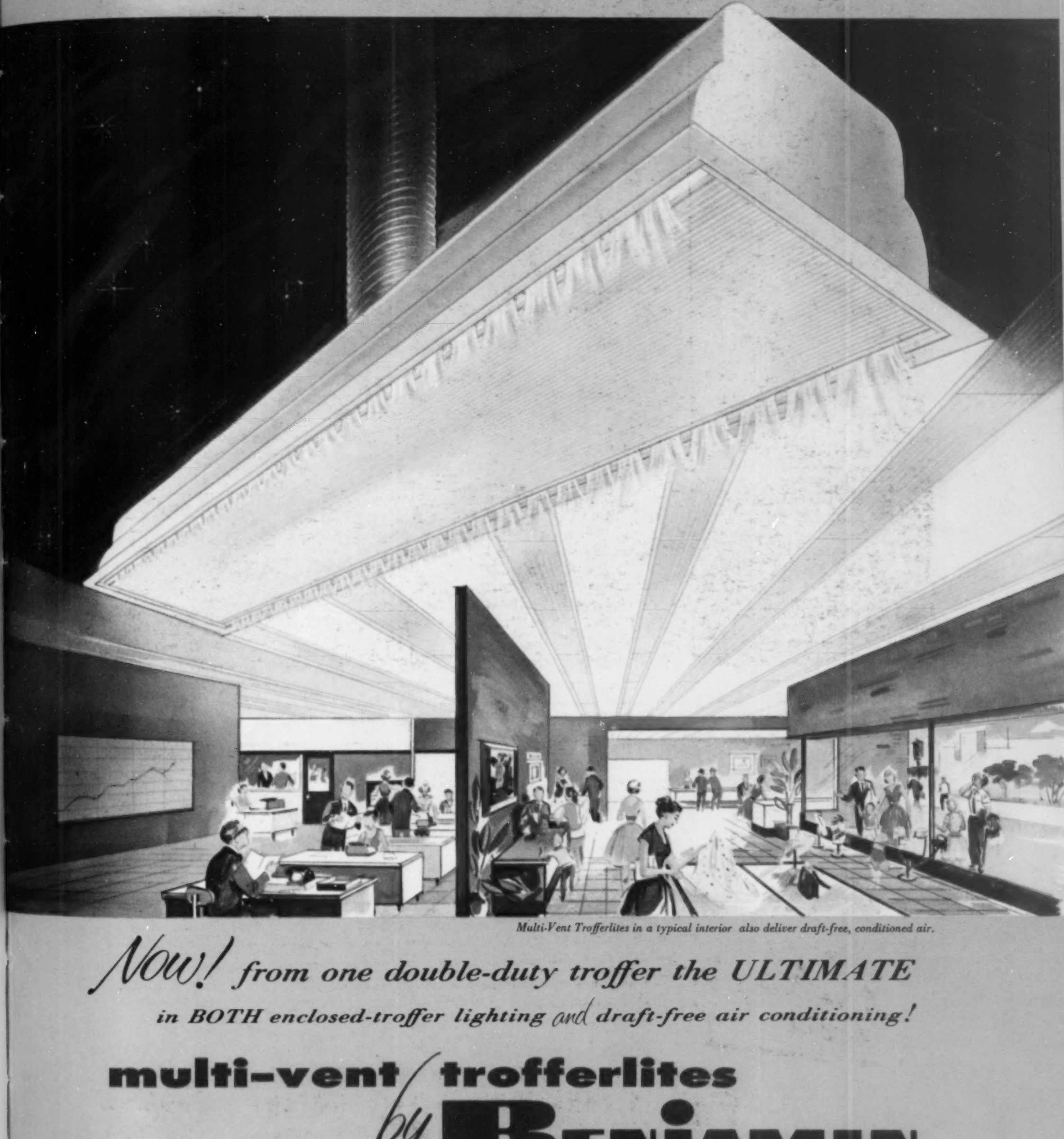

Multi-Vent Trofferlites in a typical interior also deliver draft-free, conditioned air.

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in BOTH enclosed-troffer lighting and draft-free air conditioning!

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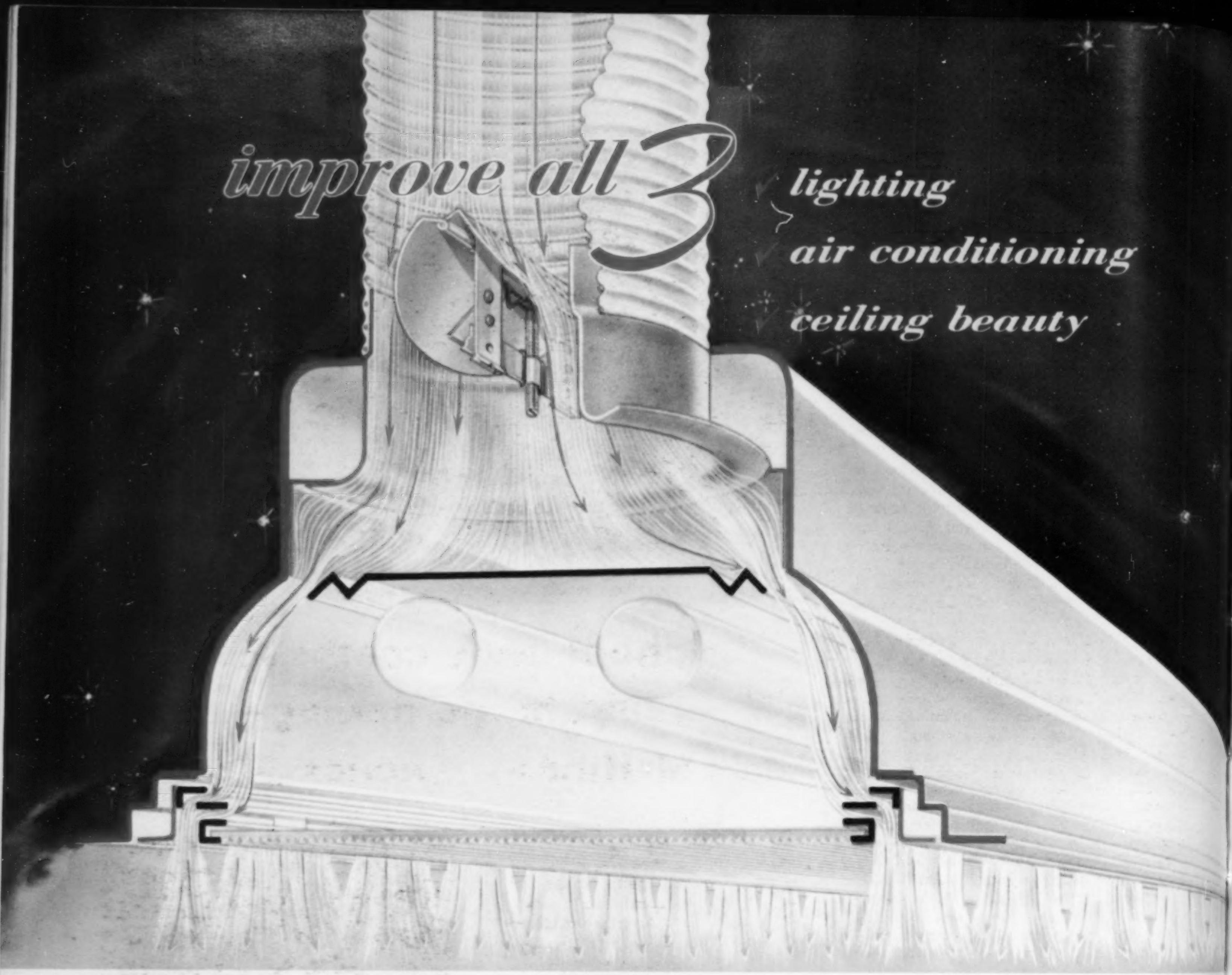
breathing conditioned air right through the lighting system



Again from Benjamin . . . another First!

Now, all the beauty and illumination advantages of enclosed troffer lighting with a unit that also does double-duty as a superior air diffuser! Never before an opportunity like this *for architects* to enhance ceiling beauty and lighting effectiveness; *for engineers* to simplify mechanical and electrical plans; *for contractors* to save time, labor and effort with faster, more simplified installations.

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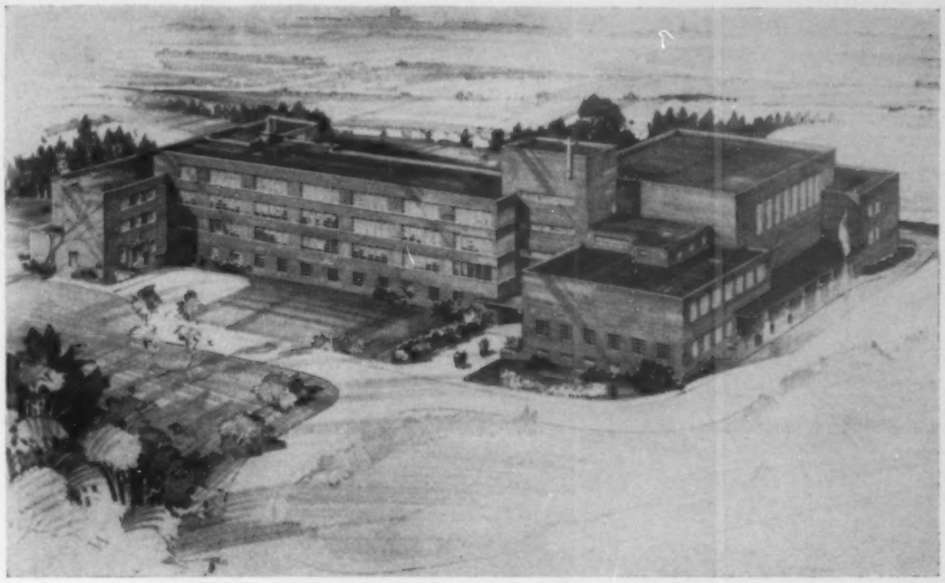
INDUSTRY'S PROMISE

A frank statement of an architect's belief in the future of plastics, particularly plastic roofing, was made by Anthony Ferrara, partner in the architectural firm McLeod & Ferrara, at the September meeting of the Plastics Study Group of the Building Research Institute in St. Louis

The greatest contribution that the plastic industry can give to the building industry is a guaranteed plastic roofing material. Such an event would revolutionize the design of buildings, gaining, first, superior esthetic forms, second, freedom from restrictive conditions, and third, stimulation of other more economical materials. These three items could be the immediate effects, but their total impact on modern construction would be unreckonable.

However, a note of warning: many new materials and new forms of old materials have been innocently promoted by the manufacturers to the point where these materials have become an abomination to good design. Again, these materials have been sold in the open market for indiscriminate use, with the result that the material loses prestige in the eyes of the general public. New materials should be introduced by the architect under precise specifications of the manufacturer so that they may be shown at their best and perform to the ultimate expectation. It has been said architects are notorious for not wanting to try new materials. Actually, architects *are* anxious to try new materials provided the manufacturer will work along with them and in the event of failure be willing to replace the defective material. To expect an architect to give his personal assurance to an owner that this material is the proper one to use, which in effect is exactly what an architect does when using any material, is too much to expect in the name of progress. If a manufacturer is willing to spend millions of dollars on advertising a new product, is it asking too much that he spend a few thousand to protect his own good name and that of the architect concerned?

ARCHITECT'S POETRY: Architecture is the thoughtful making of spaces. Reflect on the great event in architecture when the walls parted and columns became. It was an event so delightful and so thought-wonderful that from it almost all our life in architecture stems. The arch, the vault, and the dome mark equally evocative times. A column when it is used still should be regarded as a great event in the making of space. Too often it appears as but a post or prop.—*from a poetic edition of U. S. Architect Louis Kahn's speech before the Golden Jubilee Assembly of the Royal Architectural Institute of Canada.*



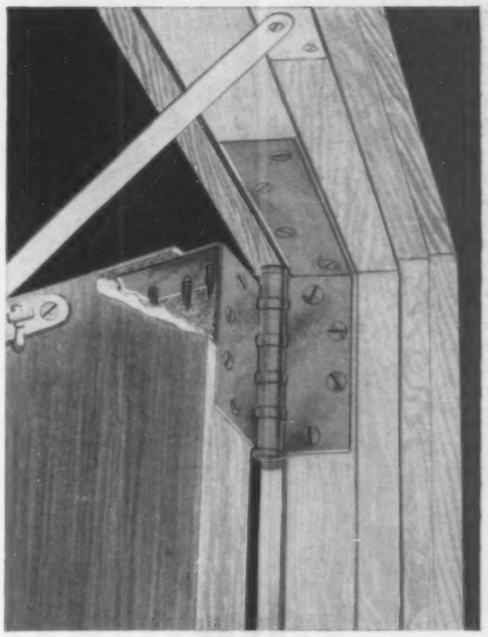
On the Archbishop Carroll High School, Washington, D.C., McKinney Anchor Hinges insure against damage to doors, jambs and hinges.

School ends costly door and hinge damage with McKinney ANCHOR HINGES*

Even though the original exterior door hinges had been replaced with heavier types, sagging doors and twisted hinges continued to be a costly problem at Archbishop Carroll High School, Washington, D.C. Then the school installed McKinney Anchor Hinges. After two and a half years Reverend Edward V. Stanford, Rector, says: "Since the installation of your Anchor Hinges we have had no further trouble. They seem to be as strong and serviceable as ever."

The McKinney Anchor Hinge was *designed* for rugged service . . . on schools, hospitals, stores, and all public buildings . . . wherever door holders or closers plus heavy traffic impose extra strain on doors, jambs and hinges. Size: 5" x 4½" with four oilite or ball bearings. For all doors, wood or metal, 1¾" to 2¼" thick. Wrought steel, solid brass or bronze in all standard finishes.

Write now for catalog 93 and templates. And specify McKinney Anchor Hinges on your next job.



Jamb leaf mortises into header, door leaf into top of door. Anchor plates and screws stay put, permanently, no matter how much strain is imposed by other hardware, heavy wind or careless door operation.

*Patent Pending

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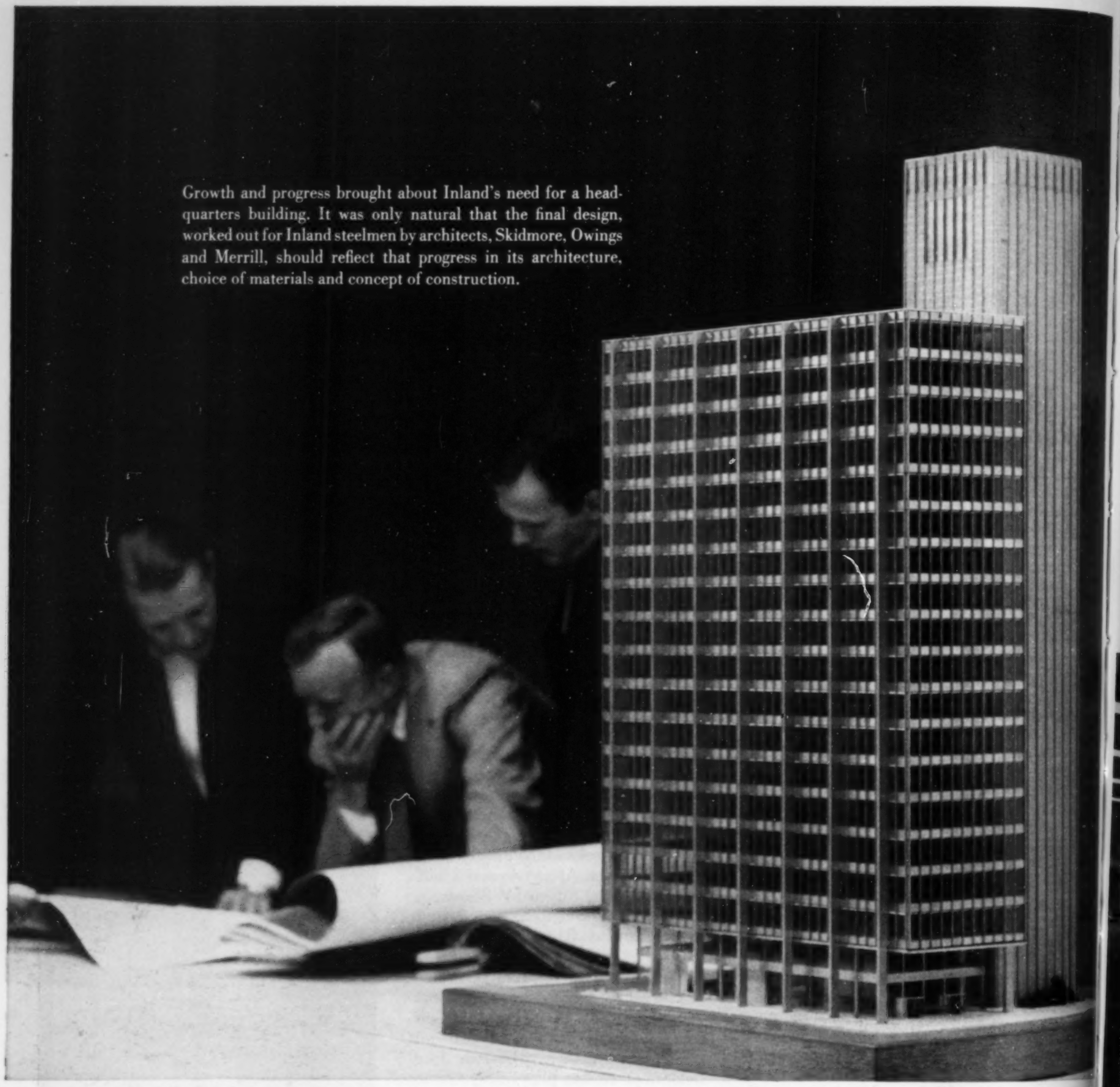
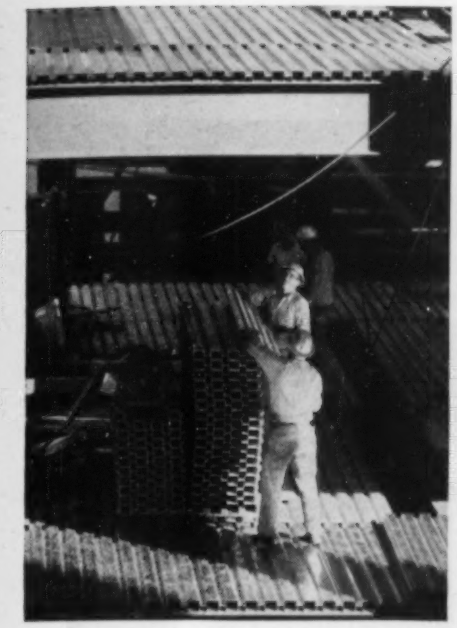


Growth and progress brought about Inland's need for a headquarters building. It was only natural that the final design, worked out for Inland steelmen by architects, Skidmore, Owings and Merrill, should reflect that progress in its architecture, choice of materials and concept of construction.

Chicago..Steel..and a new idea

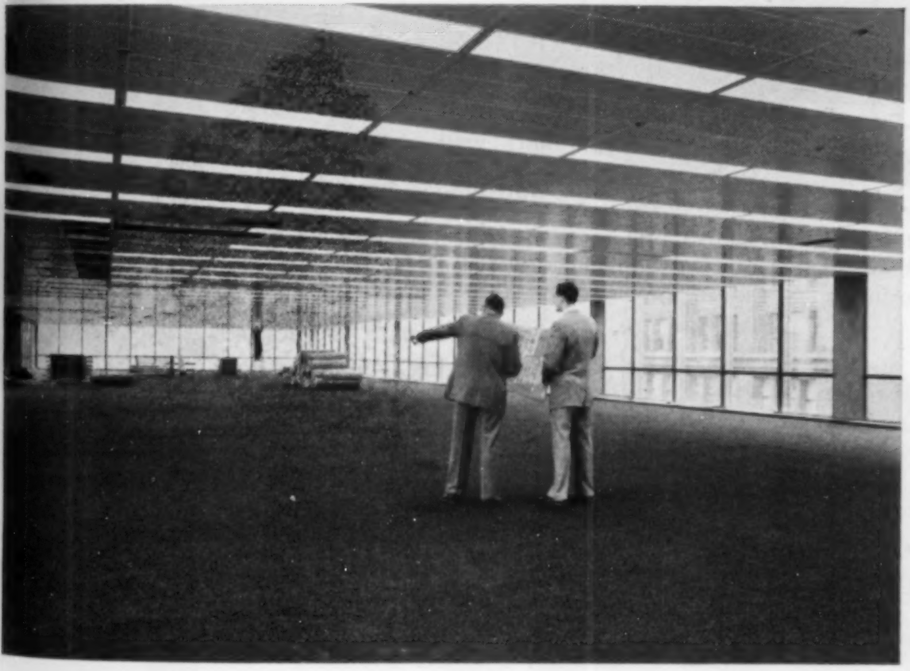
Growing with the Midwest, the Inland Steel Family of Companies Builds a Unique Home Office in Chicago

The new headquarters building of Inland Steel Company in Chicago's Loop is the only building of its kind in the world. It is steel from the top of the 25-story service tower to three levels below Dearborn and Monroe Streets. The architecture is bold—and different. So was the engineering necessary to erect it. Important contributions toward its construction were made by members of the Inland family . . . each one a steel specialist. The end result is an unusual building . . . a building in which no columns obstruct or interfere with interior space, in which office planning and arrangement is completely unhampered. Sheathed in stainless steel and glass, with clean and simple lines, the Inland building has a "look of the future", symbolizing Inland's faith in steel and in a growing Chicago and Midwest.



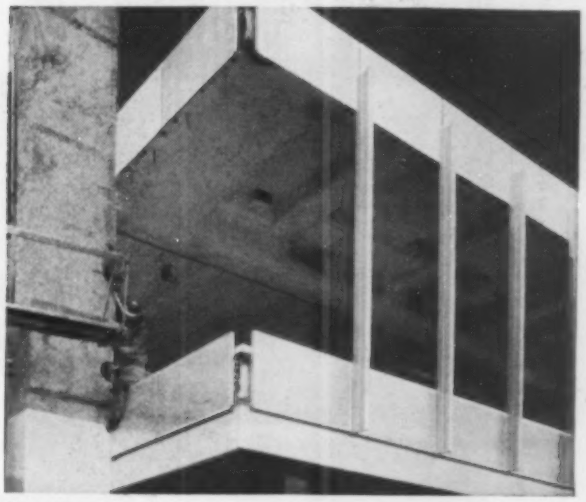
Cellular steel sub-flooring carries utility services. ▲ Milcor Celluflor®, 750 tons of it, supplied by Inland Steel Products Company, sheet metal manufacturing member of the Inland family, helps make possible an uncluttered interior. All utilities, power and light, communication lines, hot and cold air are distributed through the cells in this steel sub-flooring made of Inland TI-CO® galvanized sheets.

A unique example of welded construction. The main load-bearing girders that span the 60-foot width of the building are welded to the fourteen vertical columns. The girders and columns were made up from angles, beams and plates using submerged arc welding in the Joseph T. Ryerson Chicago plant. Shown here, a two-story section of one of the supporting columns is hoisted into place. Inland Hi-Bond® reinforcing bars for concrete walls and basement slabs were also fabricated by Ryerson, steel distributing member of the Inland family. ▼



▲ *Widest clear span multi-story building.* The Inland Steel Building is literally turned inside out. The supporting vertical columns are on the exterior leaving the inside completely unencumbered. This new design concept, plus the removal of all elevators, stairs, washrooms and other vertical risers to an adjoining service tower, means a completely flexible, open office area in the main building.

Curtain walls of stainless steel. One of the lightest, thinnest curtain walls ever used, made of 16 gage, flat stainless steel panels bonded to 2 inches of concrete fireproofing, helped to save 200 tons of structural steel in the Inland building. Ryerson supplied the stainless steel (over 400 tons) and the technical assistance on its fabrication. The main building's exterior surface is 70% solar-tinted, double-pane glass and 30% glistening stainless steel. ▼



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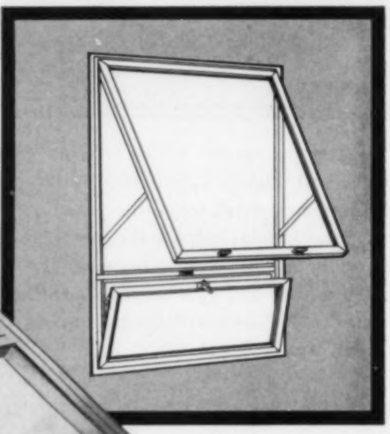
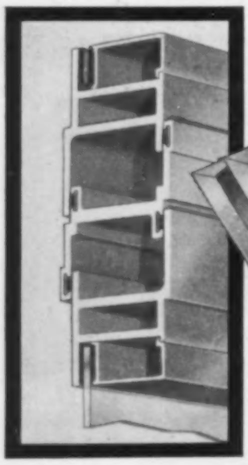
- Optional glazing, interior or exterior—channel or snap-on glazing bead available.





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This alternate top-hinged, in-swinging type makes both inside and outside surfaces easily available for rapid *inside* cleaning — saving the cost of cleaning bolts, greatly lowering maintenance costs.

Our engineering department is at your service to help meet your special requirements. For complete details, write Dept. AF-1.

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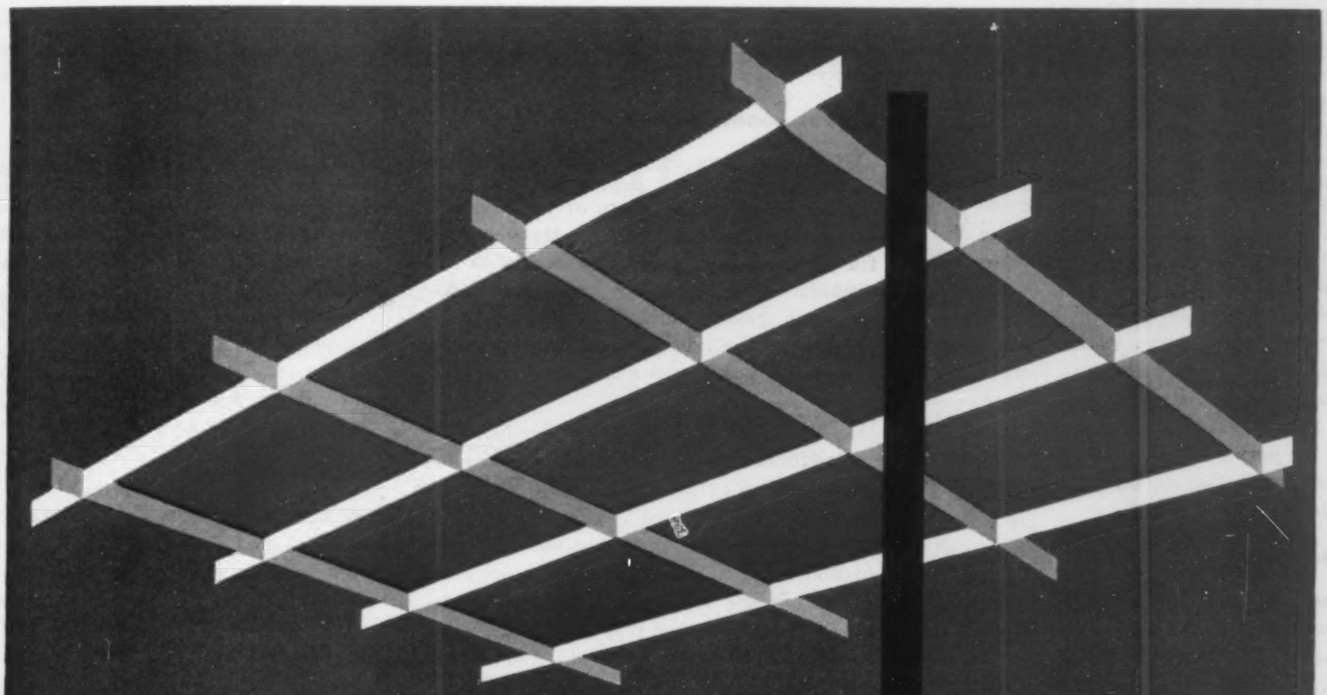

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Insulrock building slabs, random-textured, attractively finished off-white, make an interestingly patterned exposed ceiling that helps make lighter and more attractive rooms to work in . . . it's easy to paint and keep Insulrock painted, any shade, or tone, or color.

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HOW TO KEEP LAND OPEN *continued from p. 86*

new jet field at Lemoore, Calif. will include a circumference of privately owned land protected from urban development by easement purchases taken by condemnation. But in Suffolk County, L. I., Navy attempts to acquire development easements for 21,000 acres, including a resort community, aroused great hostility; the proposal was tabled. (The Navy is now seeking outright purchase of 7,700 acres with lease-back provisions for agricultural land.)

A CAA regulation makes mandatory, within a five-year period, the provision of extensive open land beyond runways at new federally aided airports. The airport may be permitted to acquire development easements in lieu of outright purchase of the land.

Agricultural use zoning

Santa Clara County, Calif., has lost 26 square miles of its best soil to Bay Area urban sprawl since 1947. In 1954, therefore, a county zoning ordinance was passed establishing exclusive agricultural zones on petition of farmers whose adjoining lands total 100 acres or more; state legislation of 1955 protects such zones from municipal annexation. These devices are temporarily saving 20,000 acres of the best soil. But additional measures are needed: tax adjustments for land kept in agriculture, a curb on the eminent domain powers of ribbon-development municipalities, and purchase by the state of surface development rights to the land. Otherwise pressures on farmers will likely overwhelm the zoning within a few years.

Three dairy areas in Los Angeles County (Dairyland, Dairy Valley, and Cypress), have incorporated themselves as towns to suppress urbanization and avoid annexation and city tax rates. They contract with the county for public services. It is problematical how long the farm owners and their zoning will withstand development offers, especially as typical current zoning already permits five-acre nonagricultural residences.

Deferred taxes

New Hampshire, Wisconsin, Michigan, and California conserve forest lands and reduce pressure on the owners to cut timber prematurely by deferring a portion of the annual tax on the land. The accrued deferral comes due as a lump sum "severance tax" when the timber crop is harvested. In some cases the state advances the deferred tax to the locality, meantime, from a revolving fund. This suggests a means of bringing together tax policies and agricultural or other open-land zoning, with the difference that the hoped-for public result would be permanent postponement of development, accompanied by its yearly-larger "penalty" of lump severance tax.

Excess condemnation

Highway laws in more than half the states now include provisions for condemnation of entire tracts of land instead of merely the part of the tract needed for right-of-way; this is to deal with the problem of tracts whose usefulness to the owner is greatly diminished by loss of a portion of the land. It can also be useful for getting reserves for future adjuncts.

Advance acquisition

California, to beat rising land costs for roads, set up in 1952 a $10 million revolving fund for advance acquisition of highway lands and has increased the fund now to $30 million. The estimated savings are $15 for every $1 invested, simply because land is bought before it is ripe for development, or already developed. Acquisitions are up to ten years in advance of need. The fund is replenished from highway appropriations when construction begins. Meantime the land is leased back to the owner. Seven other states have now set up similar funds and agencies. Advance acquisition, a vital economy for land purchases in future urbanized areas, was used as early as 1893 by the Massachusetts Trustees of Reservations.

Directed settlement

Philadelphia's far northeast section, now thinly developed, is to grow in accordance with this officially adopted plan of the City Planning Commission: A network of open land, primarily stream valleys, is reserved before development. Modified row house zoning insures concentrated development between the open spaces. The road systems are planned to violate neither the residential areas nor the open space network. This illustrates, on an urban scale, both the open land reserve and the concentration of development principles for combatting scatteration, together with road planning to reinforce the scheme.

Sonoma County, Calif. and its seat, Santa Rosa, have an agreement to combat scatteration. The city indicates where it will extend water and sewers (areas later to be annexed). The county prevents, by sanitary and zoning controls, subdivision development elsewhere. Modesto, Calif., and its county, Stanislaus, have a similar arrangement. In each case, the county government is strong and there is only one signifiicant municipality.

Denver temporarily has a "blue line" limiting development around the metropolis. Outside of the line the city will guarantee no water rights, indispensible to development. But the Water Commission deplores the necessity for control, looks forward to erasing the line in 1962. An illustration of effective public power for directing settlement, but used here only by "accident" against scatteration.

Industrial parks are prime examples of directed, compact development. Their growing popularity is based on the relative scarcity of first class industrial sites and the recognized economic advantages of designed concentration. They have been evolved because industrial zoning, theoretically with the same aims, has proved ineffective. They illustrate intelligent private policy against scatteration, not yet buttressed by comparable public policy.

Land districts

Ohio's Conservancy Districts were established in 1914, primarily for flood control, as public corporations with taxing powers. Fifteen of the original 26 districts are still active. The largest, Muskingum in east central Ohio, with 18 counties participating, has created ten lakes and owns 60,000 acres of land for watershed and flood control which is used also for recreation, farming, and timber. The last two activities now pay for the district's maintenance. The genesis of the conservency district idea was the earlier, cooperative "drainage district" system established by farmers; in turn the Conservency Districts were forerunners of the rural U.S. Conservation Districts, sponsored by the U.S. Department of Agriculture. But the future of the Conservancy Districts, always conceived as rural, is now moot. Its flood control job done, Muskingum, for example, is under pressure to sell its lake shores to developers and its reason for being is in doubt.

Metropolitan Parks, such as Cleveland's, Boston's, Denver's and Cook County Forest Preserve of Chicago, are outstanding examples of land districts with powers of acquisition and assessment (and in some cases borrowing powers) derived from the state. Marvelously foresighted in their time, they are a boon today; but they have not grown in concert with the job to be done. Leapfrogged by suburbia, they lack funds, power, and push to contend with new problems and new space beyond the new suburbia.

Merger of pertinent agencies

Ohio's Department of Natural Resources was formed in 1949 through the merger of state agencies handling forestry, wildlife, parks, shore erosion, soils, and water. Policy is guided by a bipartisan Natural Resources Commission. Bickering among agencies and pressure groups about land use has been greatly reduced by working out co-ordinated programs by area.

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agencies where they exist. It would be intelligent for vigorous local planning agencies to take the lead in instigating state action and thus help shape the program from the beginning.

There are four main ways to insure open land; the state agency should be able to use them all:

▶ Outright purchase and possession: best for land needed for immediate use, such as parks.

▶ Advance acquisition, which is outright purchase but with lease-back to the owner: best for land that will not be needed for public use until later or for which improvement funds are not ready.

▶ Development rights or easements purchase: best for land not needed for public use but which the public has an interest in keeping open; very suitable for farmland and golf courses, for example. The state buys from the owner the right to put up developments or billboards; thereafter the land can pass from owner to owner, minus the already sold development rights. By not exercising these rights, the state keeps the land open. Purchase of scenic easements—the right to block the view—is analogous.

▶ Acceptance of gifts: these include not only outright presentations, but also bequests (sometimes in the form of immediate deed to the land but with the agreement the state does not take possession until the owner's death), and the gift of development rights. Many landowners would like to have the open status of a valley sewed up and would contribute or sell development rights for a $1 binder if others did too. Gifts of rights and bequests would be stimulated by land tax concessions.

Tax concessions may have to be part of any open land program. Land minus its development rights, for example, must be taxed at a preferential rate compared with land having a speculative value. Another type of tax concession might be a deferred tax, contingent on the owner keeping the land open (see p. 164).

In cases where a local government is seriously shorn of its net tax base, the state agency might also have to negotiate a recompense to the community. If we move with dispatch this is not a likely situation.

Where coordination counts

The best guarantee of coordination between the land program and other public activities (including those of the federal government) is a strong and sympathetic governor. Gulick observed, "All you need is a governor who cares as much about breathing spaces as Pinchot and Teddy Roosevelt cared about trees."

Whatever the land acquisition agency, coordination with the highway department is absolutely vital. The new, federal highway program can powerfully strengthen and complement a metropolitan open land program—*if* an open land program exists. If it does not exist, the new roads will explode new scatterations far and wide around their interchanges. Requirements (already adopted by a few states) that highway programs are to take community needs into account cannot stick—or indeed mean anything—if the communities themselves do not know what their necessities are.

How is concentration of building development to be fostered? The location and pattern of new developments is dependent upon services, such as roads, water, sewage disposal, gas and electricity. In short, it is mainly public policies that determine where we settle—and that determine the present pattern of scatteration. It is lack of coordination and concern with results that permits development to occur anywhere.

The most specific methods for fostering concentration would be coordination of electric service, state sanitary controls, and in some places, water. Without electricity, no development. It would be to the economic interest of utilities to cooperate in fostering concentration. Anti-scatteration pollution control could specify that any lot of less than a specified size must be on a public sewage system meeting state sanitary standards, a move that should be made to rescue our scandalously polluted streams in any case.

But the best way to move forward on this front is to get going on open land acquisition at once. Open land amid the sprawl is tangible, it is understandable, its benefits to a huge cross-section of population, and interests can be made obvious. And the dismaying truth about its desperate urgency is already registered in the brain of anyone with eyes to see what has happened to the metropolitan countryside of five years ago.

Paralysis by analysis

Any leadership group that goes to work to retain open land must be on its guard against perfectionism. Metropolitan open land is interrelated, one way and another, with all metropolitan problems. This easily suggests that nothing solid can be decided about open land without the guidance of thorough research and a comprehensive plan. But fortunately the round table had the benefit of planners well accustomed to planning as a device not only for exploration and persuasion, but for carrying out decisions. City Planner Bacon, County Planner Belser, Regional Planner Fagin, and Planning Consultant Feiss all said that much open land which is eminently desirable and feasible to save at once can be pinned down with assurance, without first designing the whole works. They set the technical planning work necessary to the choice in a given metropolitan area as a few months' job at most—although it then might take longer to convince the skeptical.

Regional planning and the comprehensive coordination it implies are badly needed without doubt, but we are not going to get these by advisory works or by educating the public to the virtues of planning as planning. Turning from the general to tackle a particular—specifically, saving open land now—is no betrayal of the cause of regional planning. On the contrary, by starting to make this one aspect of region-wide planning "an incident of improvement," an open land program may accelerate *de facto* regional planning as nothing else could.

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The other to go forward with it in the definite knowledge that I myself would have to build and finance it alone . . . thus involving immense capital outlays never contemplated. I chose the latter course."

The building of the Center did employ thousands of men during the depression, and as it progressed the Center became a truly unique achievement (almost alone Rockefeller Center began shifting New York's center of gravity north from 34th Street). The Center was also a great architectural achievement. Planned so that it would combine "the maximum of congestion with the maximum of light and space," the center is a remarkable example of how coordinated development skillfully handled could open up the seams of the central city. Its 15 buildings (11 were built before 1938) take up all but 17 per cent of the 12½-acre site, but the towers have been integrated and the air rights concentrated so that the center conveys a feeling of great airiness, even though the amount of open space in its plaza, promenade, and private street is relatively small.

Tempting tenants

Rockefeller Center's first six buildings, which were finished in 1932-33, had to push their way into a real estate market in which Manhattan Class I office space was being offered at salvage prices, as low as $2 a square foot in some cases. For some floors in the RCA Building, the center was asking $2.50, but this price was understandably anything but firm. Intent on filling its buildings with prestige tenants, the center was ready to offer all the traditional concessions of a buyers' market, and then some. Not only did it trim prices and write long-term leases to guarantee them, but it credited tenants with enough money to pay off their leases elsewhere. (The situation eventually reached a point where August Heckscher's Anahma Realty Corp. started, though later dropped, a $10 million damage suit charging Center management with demoralizing the entire midtown realty market.) While Rockefeller Center's sales technique worked—the project was 83 per cent rented by 1936—it worked only at a cost of serious damage to income statements. Not until the early forties was the Center able to pull out of the red on an operating basis and then it had to wait until 1947 before making any profit after charges.

Though Rockefeller Center's rents have moved up steadily through the years, some of the scars of the depression rents are still discernible, preserved by rent controls and by the long-term leases. Today, if one counts all of its 5.2 million square feet of rentable area (including stores and storage), the average rent in the Center probably amounts to no more than $5 a square foot. Income from the Radio City Music Hall and other sources brings the estimated total take to about $27 million annually. Against this, the Center has operating costs of about $8.4 million (the $100,000 annual cost of maintaining its gardens and plaza is more than covered by the income from guided tours and the skating rink), real estate taxes of $5.3 million, and ground rent to Columbia University of $3.8 million a year. Adding depreciation, all this comes to about $20 million, which leaves a net of roughly $7 million a year before any financing costs. If the often-published figure of $125 million for the investment in the center is correct, this means a return of approximately 6 per cent. And while this may be no more than the Rockefellers hoped for, it is modest, indeed, when one considers the great civic success that the center has been. (By comparison, the Empire State building, which chose to leave much of its space unfinished rather than try to rent it at depression prices, shows an average rental of $6 a square foot today and a profit ratio roughly four times that of Rockefeller Center.)

Patience required

In the light of this record is there, then, really an economic case for open space? The fact that none of the four projects completed so far shows an extraordinary profit in no way rules out the possibility that in the long run open space, used wisely, may produce a more lucrative investment than the building that takes up the entire site. Very probably, Rockefeller Center would prove this today, if it were not for the scar tissue of the Thirties.

But it is also true that such long range benefits are too remote for the average commercial builder today who wants a maximum return in a minimum time. Still the "long view" is probably close enough to insure a handful of future projects by owners who are interested in prestige and civic betterment and who are willing to wait for the cash.

Beyond this, though, if the city really wants to get more open space it is probably going to have to do something to get it. Certainly, the city has the power to act in the public welfare, and there is no question but that the health of downtown vitally affects that welfare. Open space, properly used, could go far in reviving ailing commercial districts and to achieve it the city might use any one of a number of techniques. One way, often suggested, would be to grant tax relief for land left open on the site. This involves tremendous legal problems, however. A far more likely approach seems to be the one taken in Chicago's new zoning ordinance. Enacted last year, it allows a premium of extra stories to buildings which face a park or leave space open on the site.

An even more direct way of insuring open space, of course, is for the city to provide parks for downtown areas. But this is the true acid test and before very much is done about parks, people will have to demonstrate more convincingly that they really desire open space.

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verse expansion joints. Had the concrete membrane been poured without them, a "shell arch" would have resulted. The rise and fall of this "shell arch" spanning between the abutments (when subjected to shrinkage and temperature deformations) would create such "up-and-down" movements that it would break in the vicinity of the building perimeter, since the auditorium building would not tolerate these deformations.

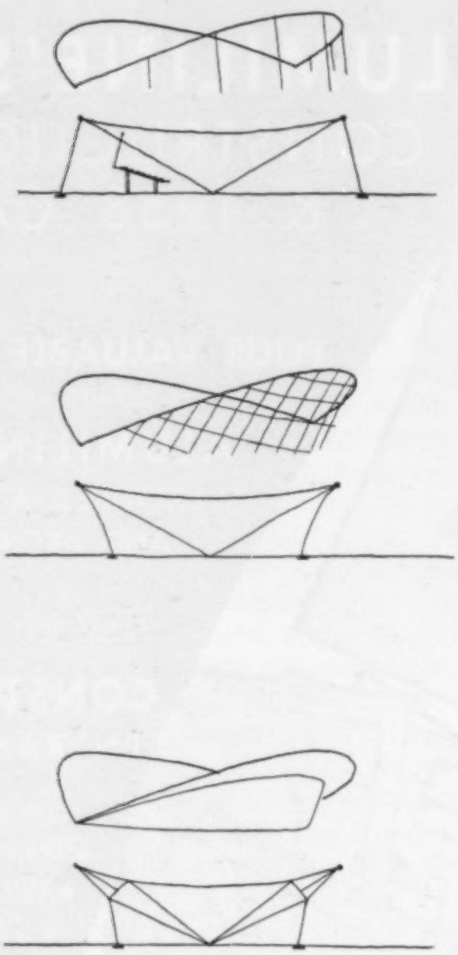
Otto: The inner roof is a prestressed concrete slab of very heavy weight (40 to 50 pounds per square foot). Ostensibly, this heaviness is the result of acoustical design. Below the slab there is a suspended ceiling carrying floodlights and lighting fixtures.

Stubbins: The weight of the concrete membrane over the auditorium proper is heavier than need be for structural reasons. This mass, plus the hung plaster ceiling, is necessary to dampen the transmission of exterior sound. In fact, this requirement had more to do with the final determination of where roof loads were to be taken than any other. Acoustics were largely responsible for the choice of concrete for the auditorium walls and the connection these make with the roof. It would have been arbitrary not to employ the walls for support.

The interior convex form of the saddle roof is inherently good acoustically as it disperses rather than focuses sound. The attention given to acoustics has produced wonderful results: in almost every respect they are superb.

Otto: A roof structure of this kind is very expensive. It would not have been difficult to achieve a roof of similar shape more economically by tensioning the outer arches, achieving a thin edge at the same time (sketches above).

Stubbins: These suggested methods of tying down the arches or edges were considered and discarded as impracticable and unsightly. It must not be forgotten that such wire ties would have to be fireproofed, making them quite heavy (like columns) in appearance.



THREE PROPOSALS *by Frei Otto for tensioning the arches to achieve a lighter roof structure:* TOP, *by guy wires;* MIDDLE, *by a net (left open or used as a frame for enclosing side walls);* BOTTOM, *by the side walls of the auditorium itself.*

Flag of Berlin is raised over the plaza

MICHAEL ROUGIER—LIFE

Otto: Actually, however, the structure of the roof is secondary. It only serves as a means of achieving the shape. A unity of form and function was not aspired to.

Stubbins: Every architectural work has a functional purpose. But if function were to be the sole dictate of form, we would have an architecture as trite and devoid of spirit as the architecture of classical eclecticism—albeit more practical and scientific. Truth in architecture is not the exact disclosure of function any more than it is the exact exposure of structural elements. Form as an expression of function and as a consequence of structure must be ordered to an expression of beauty.

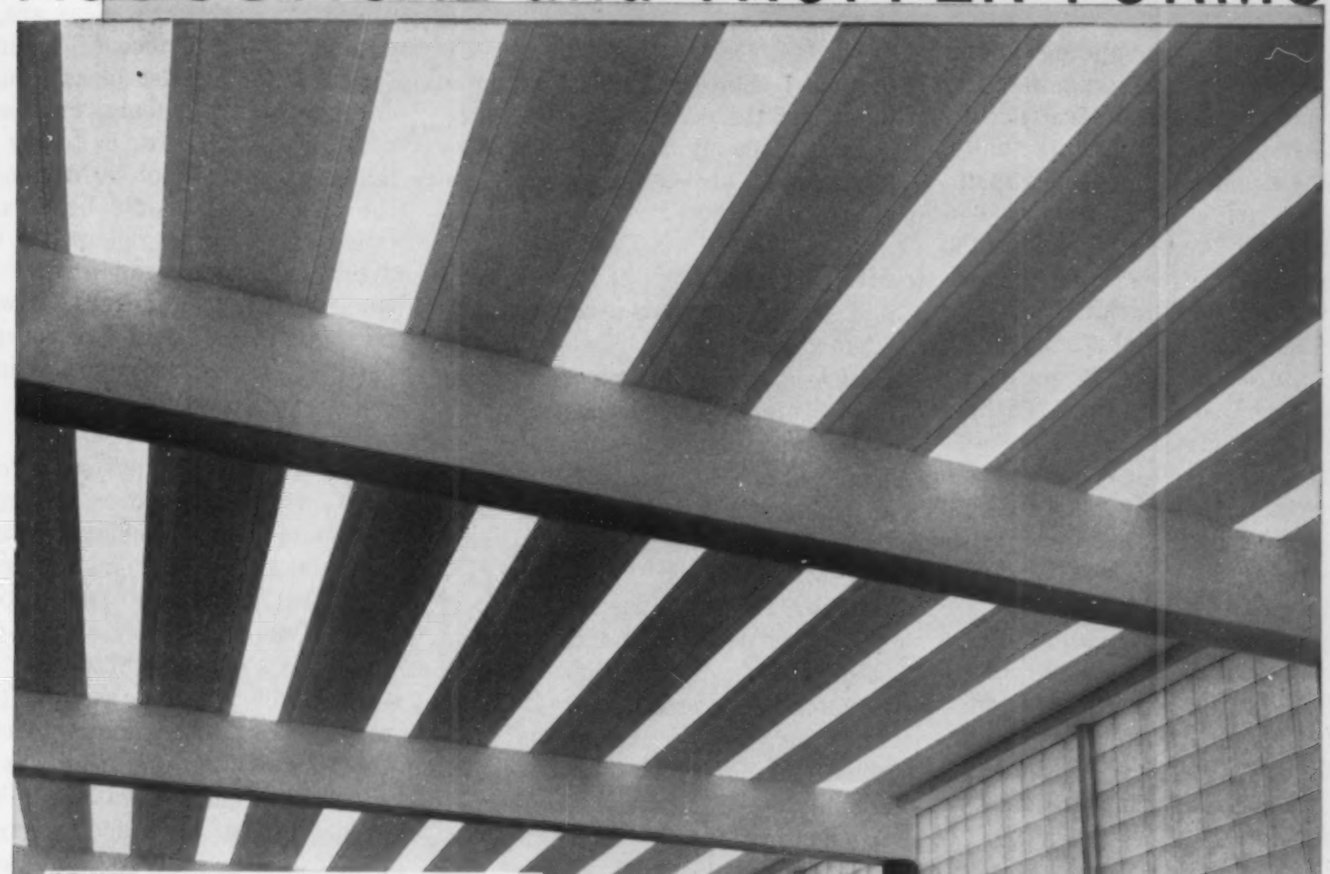
Otto: As a shape, the building dominates the skyline (photo, page 118). From a distance, the simplicity of the original concept is apparent. But close up, everything becomes too heavy: arches, columns, railings, even the flag poles. It is hard for anyone to speak freely in the shadow of such overpowering forms.

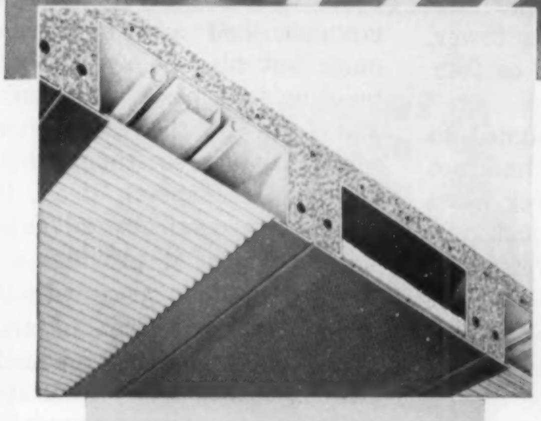
Stubbins: What we are talking about here is monumentality. Even though humanism is at the roots of modern architecture, man should not be deprived of the true and eternal qualities of contrast in scale.

Perhaps the principal goal should be stated here: the development of an environment which would enhance deeply the processes of thought and communication which are to occur in it. The creation of a generous shelter with a sense of openness and hospitality to the world seemed a natural expression of this goal. The suggestion of things common or shared by people gathered under a liberal roof seemed fundamental. Similarly, the setting apart of a wide area of the Tiergarten—raising it above its natural flatness — to provide a special place where immediate concerns were removed and replaced by broader,

continued on p. 172

ACOUSTICAL and TROFFER FORMS





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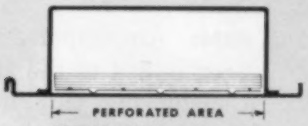
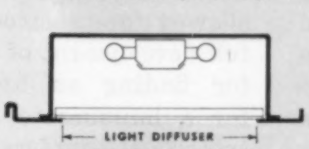


SECTION M1A (Acoustical)



SECTION M1T (Troffer)

Above is the Ceiling of the Auditorium in the Eugenia Mettetal School, Detroit, Michigan. It is one of 50 rooms with Mahon Acoustical-Troffer Ceilings. Shreve, Walker & Associates, Inc. Architects. Alfred A. Smith, Inc., Gen. Contractors.

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more distant views had a special significance.

Otto: Certainly, a building and a piece of sculpture have similarities. Each is a man-made structure in space—both visually and tactually. In this sense the architect is a sculptor, but his productions have a larger scope than the sculptor's. Frequently, hundreds of people work on his designs and thousands of people use them. And a small piece of sculpture can easily be set aside; a building cannot. The rebellion against the static quality in our architecture is easily understood. Today we strive for plastic form, but to work in true plastic form is difficult. It is easy to emphasize plastic qualities which are not inherently a part of the building. It is also easy to translate the purpose of a building into an improper form.

But every problem in a building should be solved, just as every detail of a piece of sculpture must be worked out.

Stubbins: You can call it sculpture if you want, but the interaction between the careful, logical, and disciplined form of the supporting functions forming the plaza and the intuitive, lyrical form of the auditorium was a technique for broadening the amplitude of the sought-after environment. This seemed especially important in a sequence where the rational, logical form is fundamental and preparatory to the more mercurial one.

Otto: In reality, "free speech" is something that cannot be built but a building to house free speech can. Man often symbolizes ideas as a warning, a reminder, a lesson. Such symbols are found in the enormous statues of men and animals representing moral concepts or the power of the conqueror over the conquered. But when art tries to teach a lesson, it ceases to be art.

Of course we need symbols. But can a suspended roof be a symbol for free speech? I believe that we are past the time of the Statue of Liberty or the Goddess of Victory. Is there any difference between a symbol taken from nature or a symbol taken from a new form of construction?

Stubbins: Since man first made a picture on the wall of his cave, since he first made signs to convey meaning, symbols have been a part of his nature.

Otto: Traditionally, the frock coat and the uniform are used to give a surface impression. Modern architecture gave up surface ornamentation, preferring plainness to falsity. But now, simplicity can lead to the worst kind of representationalism. In gold, steel, and glass we say: "Look how simple we are—how modest."

It is a truism to say that a building must work both functionally and structurally. For a time, modern architecture overemphasized function, but this we are at last overcoming. Now, structure, which should remain secondary, is becoming dominant.

A simple flat roof can be suspended from a tremendous tower, but it can also be supported on four columns.

Many buildings are designed to be sensational, as if we had not learned that the time is over when mankind considered technical progress an exceptional achievement.

People today are full of fear. They also fear us architects—not without a certain justification. But in architecture we must be daring because we have very important problems to solve. Shells, light framework, and suspended roofs were developed to keep the weight of a building to a minimum, to save money and energy, and especially to increase interior space. They were developed to free us from the rigid old building forms and to obtain flexibility for today's quickly changing circumstances. Of these methods, the thin net especially allows building with only a fraction of previous efforts.

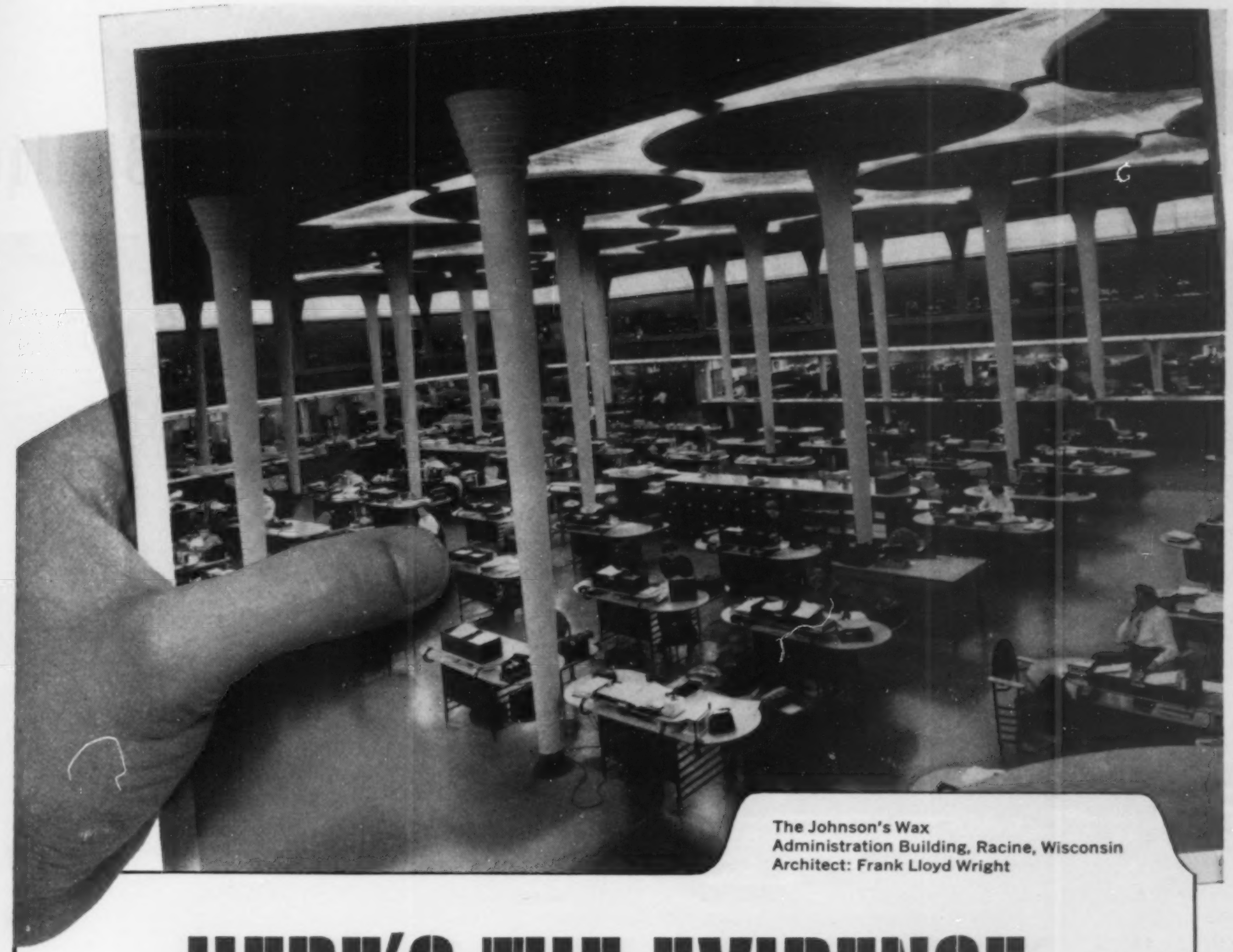
If the simplest space enclosure for a certain building program is to be achieved, only one structural solution is especially suited. The shape of the building develops during an intensive search. The more intense this search is and the less preconceived the architect's ideas are, the greater is the chance of finding a form of the highest plastic quality and therefore symbolic expressiveness. I will go so far as to say that buildings should not be designed—the architect can only be of assistance to their taking shape. A Congress Hall designed in this way would look quite different. It would be more modest and less conspicuous. And it would be more fitting to the purpose of the building.

Stubbins: There is never an "only" solution in architecture. In fact, approaching this problem with no preconceived ideas, my associates and I had a number of very different conceptions before arriving at what appeared to be the best.

In order not to labor the point, may I just say that it was my objective to plan and organize the various elements in such a way as to house them within a structural system that would not only generate an uncircumscribed and hospitable climate but also be symbolic of the building's purpose. The controversial form of the auditorium has many advantages: though not symbolizing free speech itself, it provides an acoustically advantageous inner surface; it provides a large, covered, outdoor space without definition or demarcation of areas; it continues the uplift of the land; it is closed and still open; it has strength and purpose; it is monumental and, above all, it has beauty.

Otto: An important building has been added to the skyline of Berlin. Considering this importance, it is obvious that not enough time was allowed for construction or for the full development of the scheme. As for finding an appropriate form for a building to symbolize "free speech," the surface has hardly been scratched.

But a beginning has been made. Now, we must not rest. We must go on to see that, in many places throughout the world, real buildings will be built where people estranged now will find each other.



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Architect: Frank Lloyd Wright

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Eastland Shopping Center in the northeast section of Detroit, Michigan. 56,000 Sq. Ft. of Mahon Insulated Metal Curtain Walls and 48,000 Sq. Ft. of Mahon Steel Roof Deck were employed in the construction of this outstanding and colorful structure. Victor Gruen & Associates, Architects. O. W. Burke Co., Gen. Contrs.

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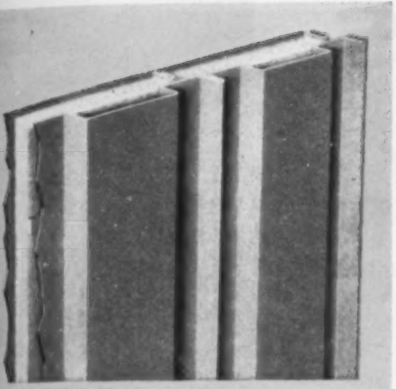
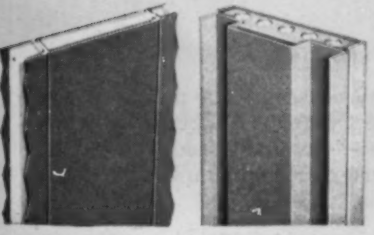
Employed to Lend Color and Attractiveness to Exterior of Mammoth Shopping Center!


MAHON FLUTED WALL
FIELD CONSTRUCTED

MAHON RIBBED WALL
FIELD CONSTRUCTED


FLUSH FLUTED
MAHON PREFAB WALL PANELS

The low-cost permanence and attractiveness of Insulated Metal Curtain Walls are today being designed into an ever broadening range of building types. In the Eastland Shopping Center, illustrated at the left, you see an unusual building in which Mahon Metal Curtain Walls in harmonizing colors were used extensively in combination with other materials to produce an attractive and colorful exterior.

Some of the country's outstanding architects have employed Mahon Insulated Metal Curtain Walls skillfully and to good advantage, costwise, in producing striking exterior design effects in office buildings, shopping centers, schools, armories, military barracks, sports arenas, parking garages, warehouses, industrial buildings of all types—including power-houses, and some important monumental buildings.

Metal Curtain Walls with exterior plates of embossed or colored aluminum, stainless steel, or cold rolled steel painted, employed in combination with brick, ornamental stone, glass block or other materials offer unlimited possibilities in architectural treatment of exterior design. Bright metal, or colored metal, provides the designer with the means of individualizing and creating distinctiveness in almost any type of building.

In Mahon Insulated Metal Walls, vertical joints are invisible—symmetry of pattern is uninterrupted across the wall surface . . . and, the field constructed walls can be erected up to sixty feet in height without a horizontal joint. These two design features, which are extremely important from an appearance standpoint, were engineered into Mahon Insulated Metal Curtain Walls to give you a finer appearing wall surface with a continuous pattern free from unsightly joints.

You'll want to investigate these Mahon "better look" features before you select a metal curtain wall for any building.

See Sweet's Files for information or write for Catalogue W-58.

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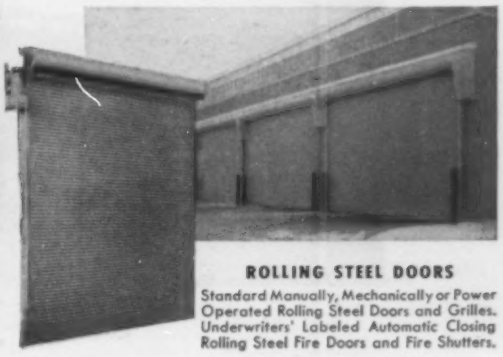
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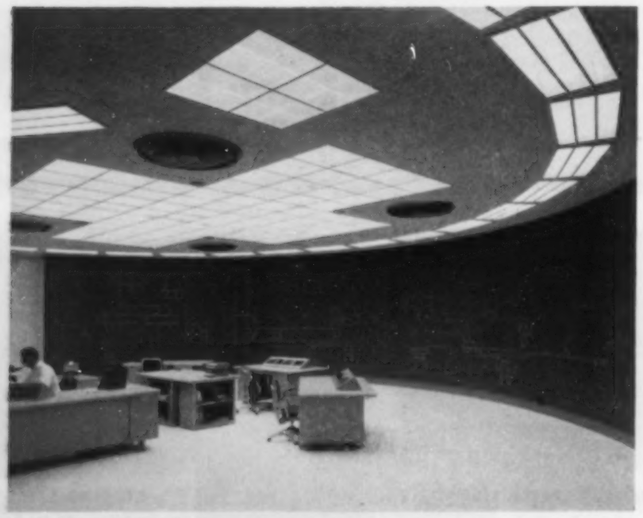

The luminous ceiling provides high intensity and low brightness far beyond the average lighting job. Combined with high reflectance ceiling, wall, and floor finishes, it reduces contrast to a minimum and, by solving the glare problem, aids work efficiency and comfort. No wonder the installation was a prize winner in the 1957 International Lighting Competition — Electric Utilities Division. Yes, and the operators are enthusiastic, also.

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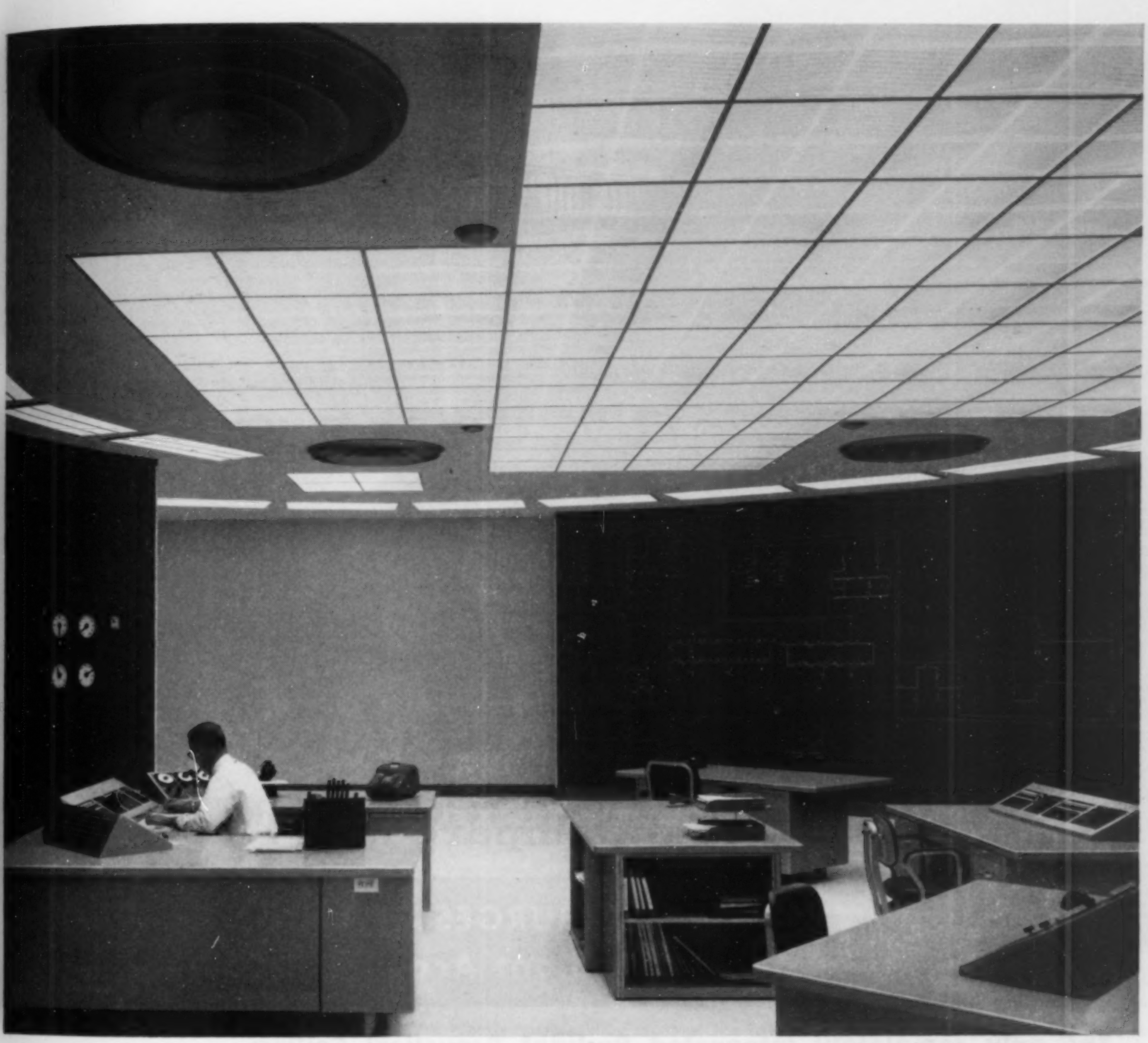

Installation: Connecticut Valley Power Exchange, Bloomfield, Conn.

Architect & Engineer: Alderman & MacNeish, West Springfield, Mass.

Lighting Consultant: John F. Dougherty, Hartford Electric Light Co., Hartford, Conn.

General Contractor: Industrial Construction Co., Hartford, Conn.

Electrical Contractor: T. J. Martin Electric Co., Hartford, Conn.

Area: System Operators' Room

Finish: Floor — 47% R.F. off white. Desks — gray, mist-gray tops. Walls — light tan. Control Boards — medium dark green (for contrast). Distributing tapes — multi-colored. Ceiling — marbleized white.

Fixtures: Litecontrol standard lens ceiling panels with Holophane #6024 acrylic lenses, and F40T12/RS rapid start lamps, 12″ on centers.

Intensities: All lamps on —
Average room intensity 30″ from floor — 206 foot-candles
Average intensity on desk tops — 230 foot-candles
With half the lamps on, these figures become 120 and 135 foot-candles, respectively.
Average vertical intensity on Distribution Board, 91.9 ft.-C
Average vertical intensity on Instrument Board, 89.3 ft.-C
Variation in readings, 12″ intervals down Boards, 81 to 95 ft.-C

Brightness Readings: Across axis of lamps — Lens Ceiling —
15° down from horizontal, 108 foot-lamberts
30° down from horizontal, 276 foot-lamberts
45° down from horizontal, 497 foot-lamberts

Along axis of lamps —
15° down from horizontal, 140 foot-lamberts
30° down from horizontal, 145 foot-lamberts
45° down from horizontal, 158 foot-lamberts

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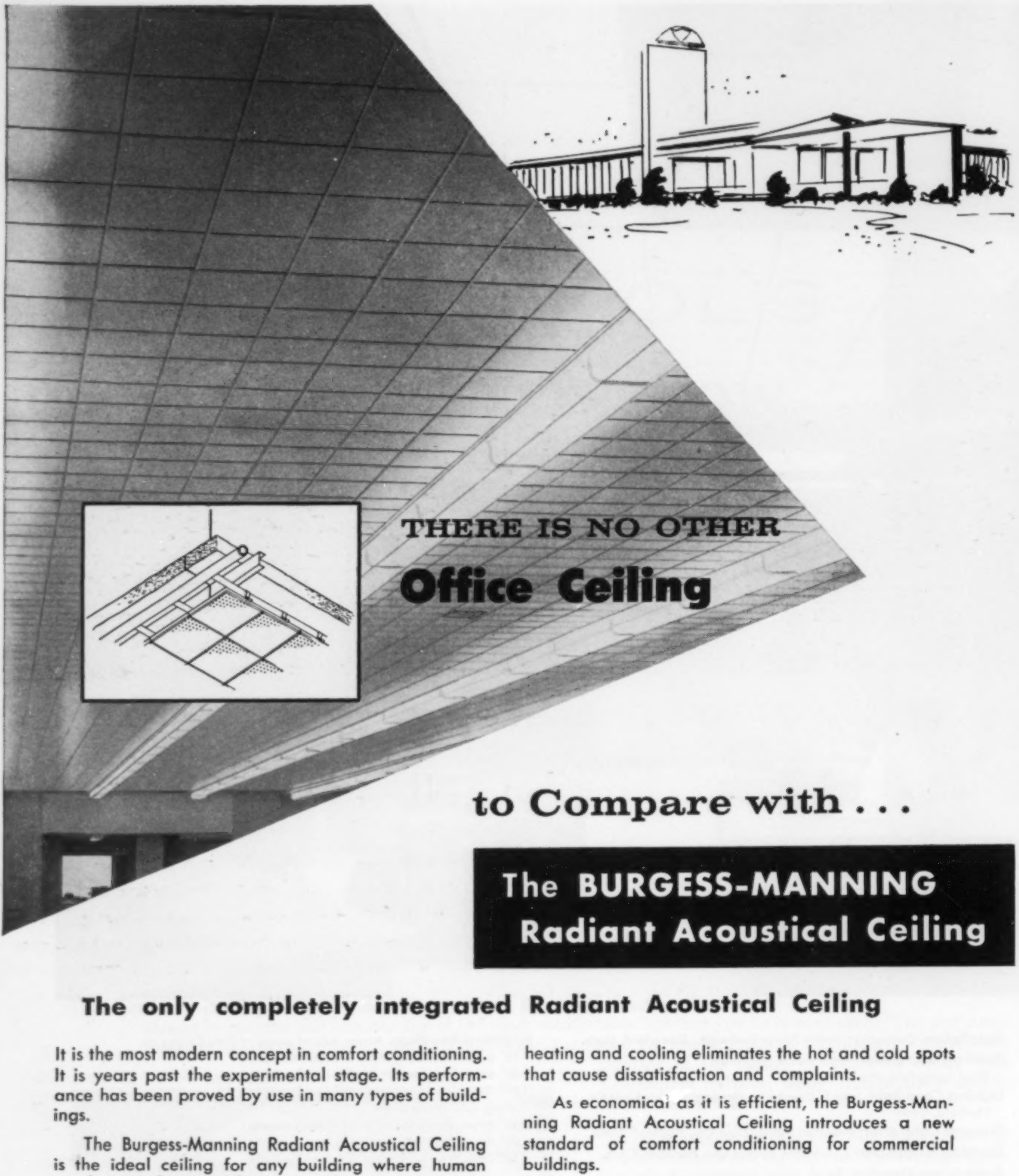

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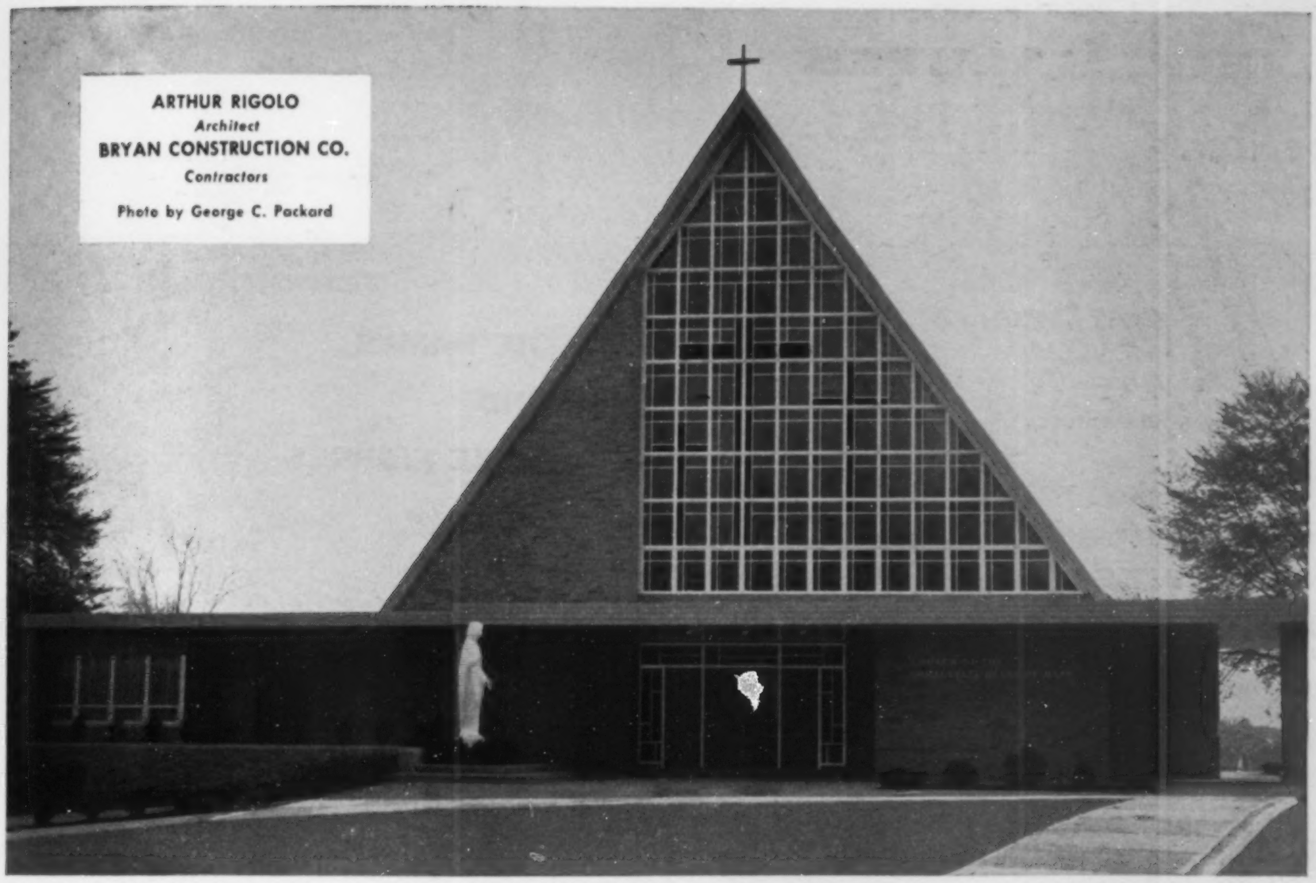

ARTHUR RIGOLO
Architect
BRYAN CONSTRUCTION CO.
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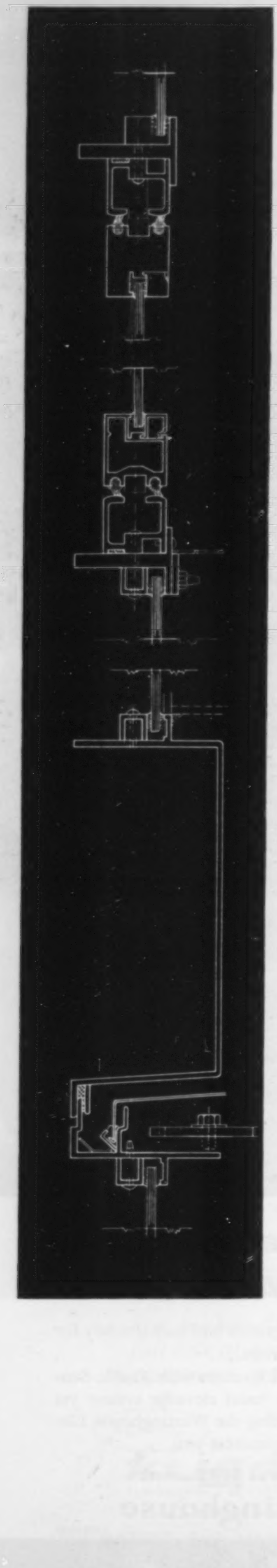

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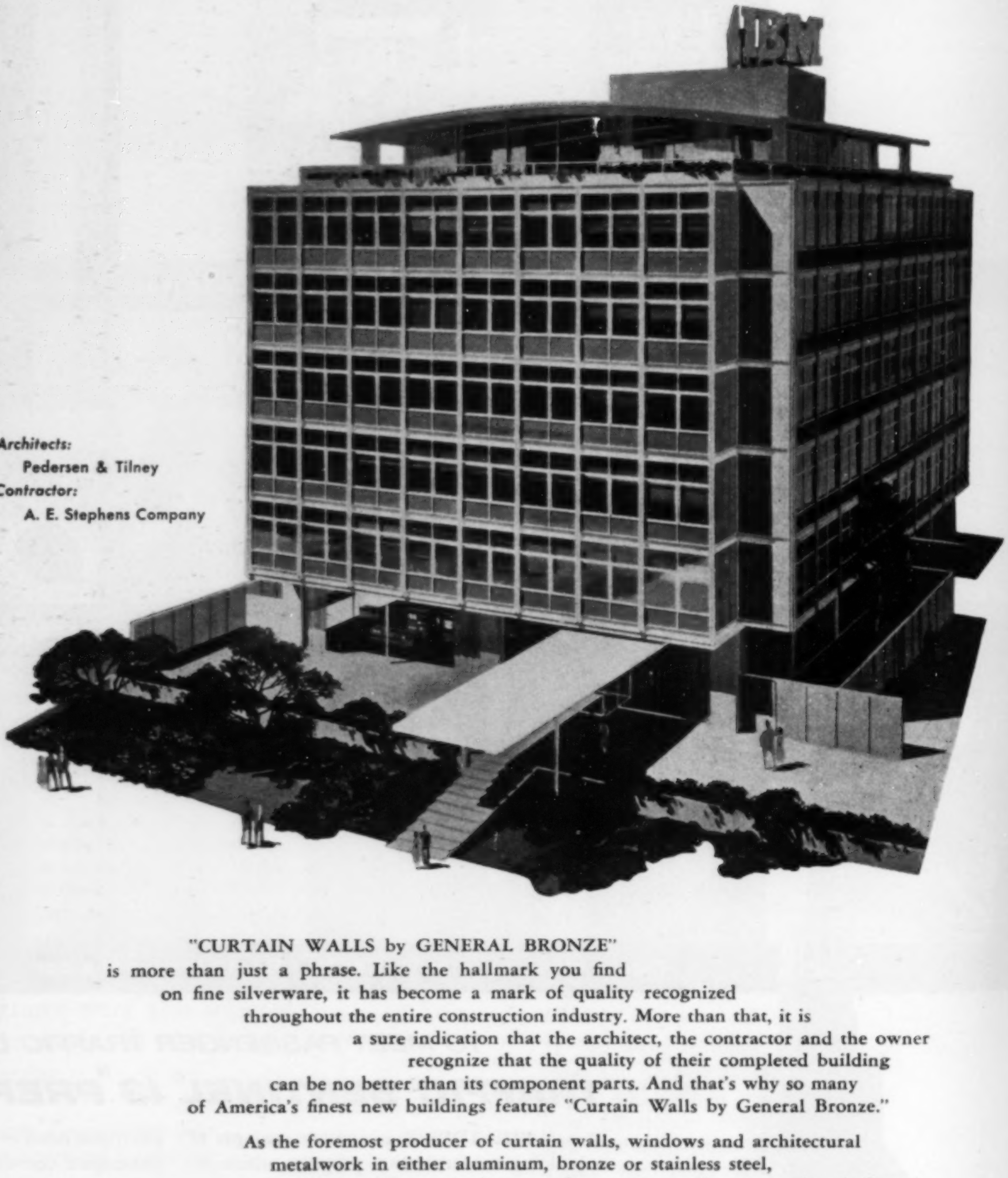

Architects:
Pedersen & Tilney
Contractor:
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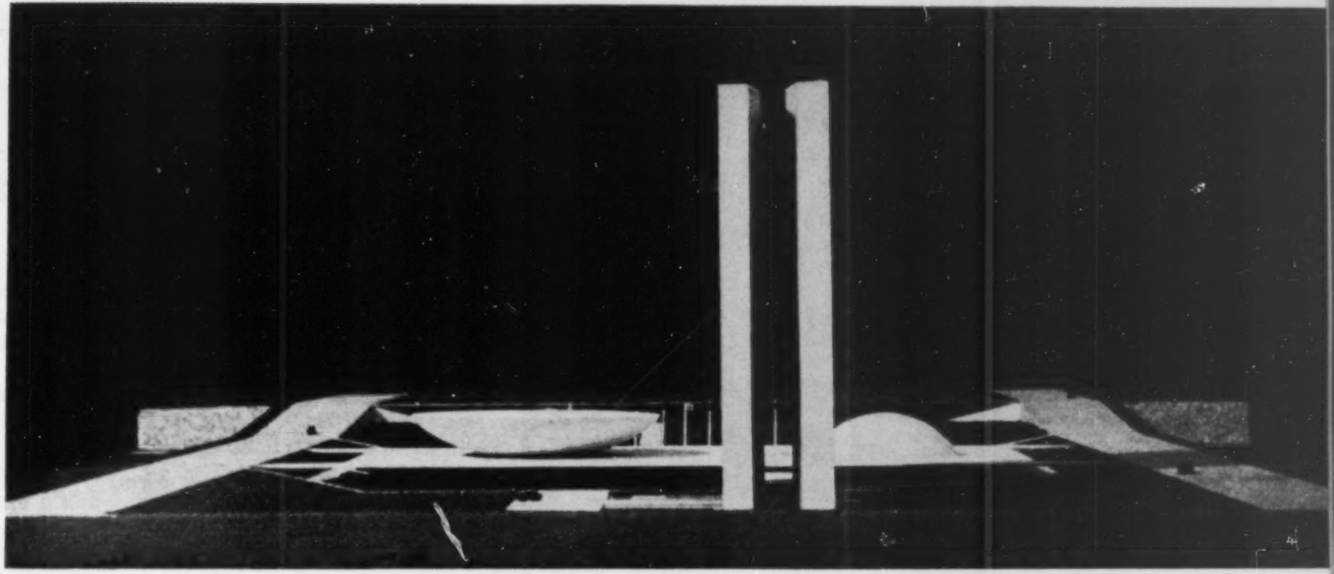
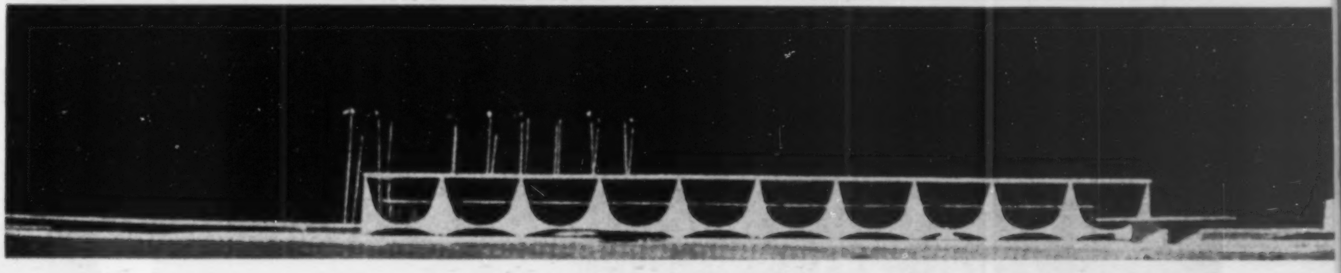
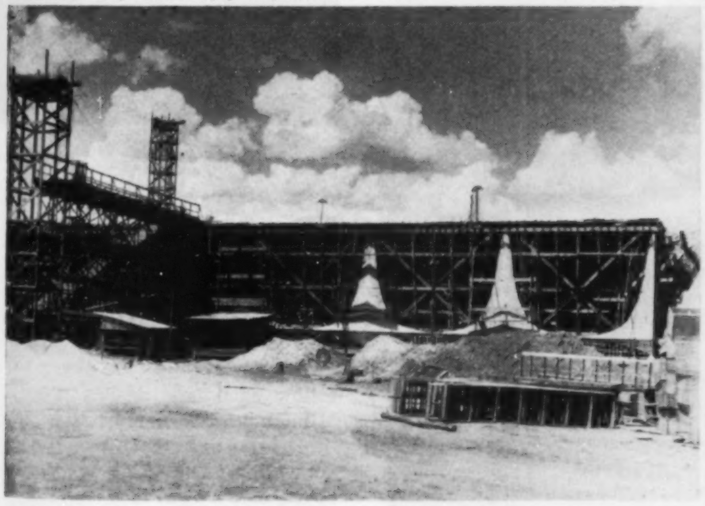
Abroad

A continuing review of international building



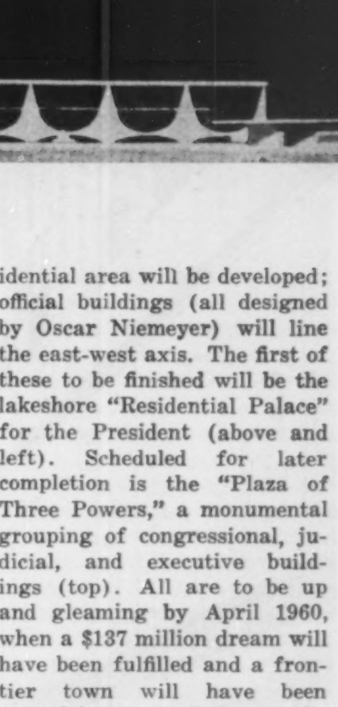


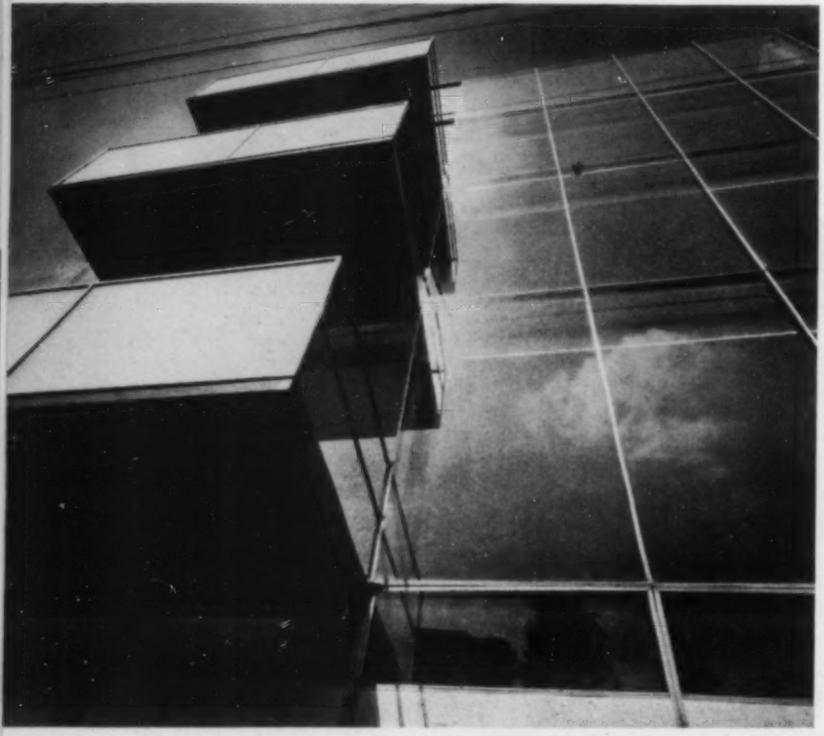
PHOTOS: (BELOW) TAD SZULC; (ABOVE) COURTESY "BAUWELT"

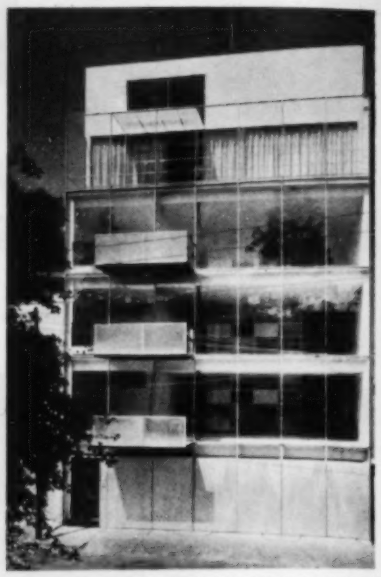


BRASILIA

Brazil is building a new capital city, remote but booming. President Juscelino Kubitschek is the most avid promoter of the "Brasilia" ideal, believing not only that the capital's location, 500 miles from the coast, will bring growth and vitality to the country's hinterland, but also that the plan, by Architect Lucio Costa (see contest-winning sketch, below), will give a new sense of order to the sprawling nation. Brasilia is layed out as a cross, approximately seven miles long and five miles wide, beside a huge, man-made lake. Along the north-south axis of the cross the city's residential area will be developed; official buildings (all designed by Oscar Niemeyer) will line the east-west axis. The first of these to be finished will be the lakeshore "Residential Palace" for the President (above and left). Scheduled for later completion is the "Plaza of Three Powers," a monumental grouping of congressional, judicial, and executive buildings (top). All are to be up and gleaming by April 1960, when a $137 million dream will have been fulfilled and a frontier town will have been turned into one of the world's truly urbane capitals.







PHOTOS: DE GUILLERMO ZAMORA

LESS IN MEXICO

In the contest to test which modern architect can reduce structure to the point of complete invisibility, a strong contender is the Mexico City design team of H. V. Moreno and R. T. Martines (FORUM, Dec. '57). Their latest entry is an apartment house that seems at first glance (left) to be nothing but a six-story mirror. Closer examination shows that there is, however, some bracing against the elements (above), and that the building contains five good-sized apartments, a garage, a penthouse, and a studio-solarium.

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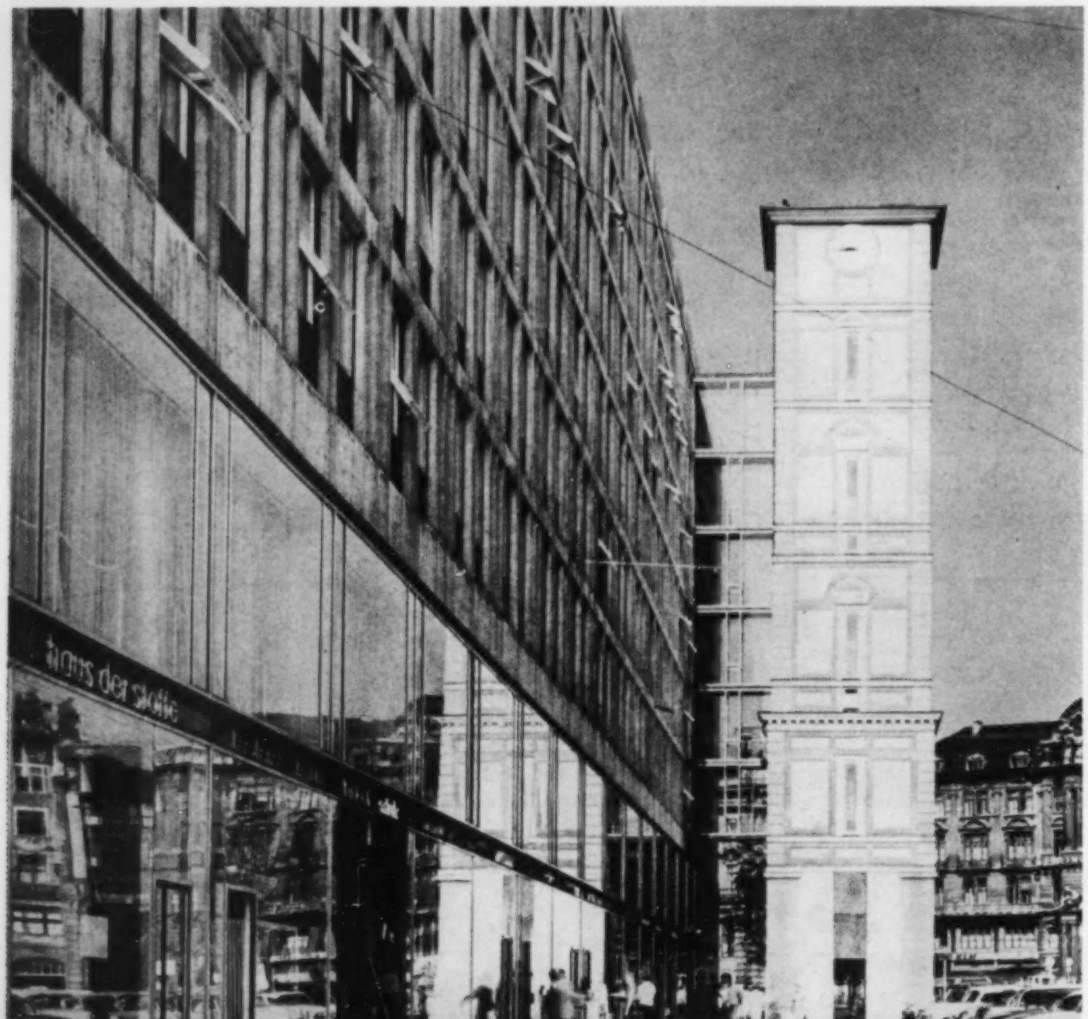
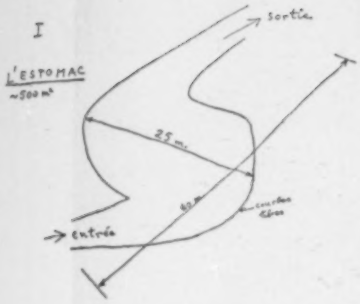
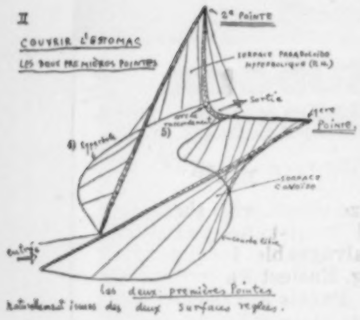


MAX PRUGGER

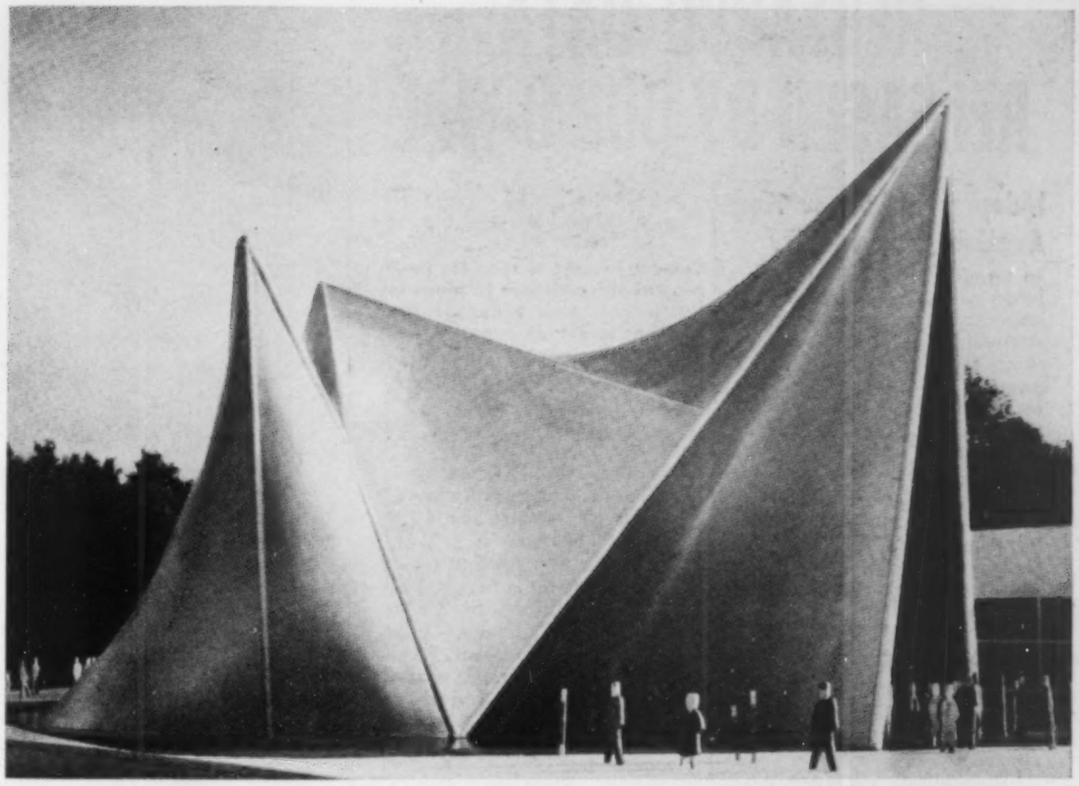
MORE IN MUNICH

Whereas other European cities have been perhaps too eager to follow each new design trend, Munich has been slow to shed its provincial features. Last year one of the few exceptions to the city's local look was completed, the rebuilding of the "Maxburg" area. But even in this case a handsome nineteenth-century tower provided the scale and set the rhythm for the design of the steel and glass building. Architects Sep Ruf and Theo Pabst worked out the compromise.

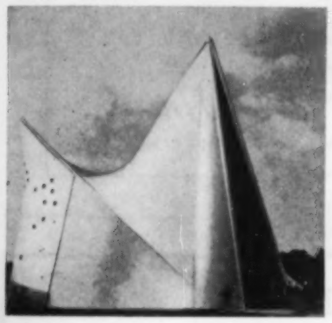

I
L'ESTOMAC
~500 m²
Sortie
25 m.
40 m.
courbes libres
entrée


II
COUVRIR L'ESTOMAC
LES DEUX PREMIÈRES POINTES
2e POINTE
SURFACE PARABOLOÏDE HYPERBOLIQUE (P.H.)
Sortie
1ère Pointe
SURFACE CONOÏDE
courbe libre
entrée
les deux premières Pointes
naturellement issues des deux surfaces réglées.

COURTESY "BAUWELT"



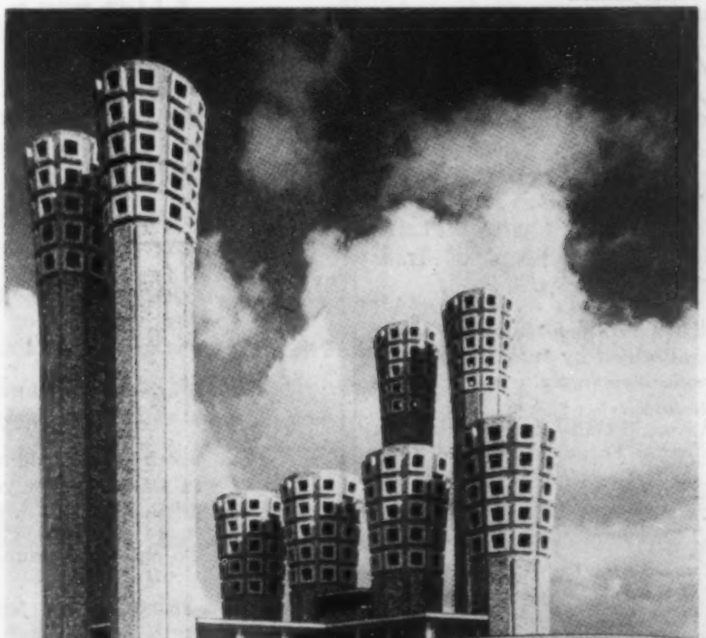
COURTESY "BOUW"



TENT FOR BRUSSELS

Philips Electric wanted a pavilion at the forthcoming Brussels World's Fair that would express its enthusiasm for "the World of the Future." They picked Le Corbusier as the best architect for the job, largely because of his similar enthusiasm, similar interest in new forms and bizarre lighting. The prestressed concrete tent that he devised has some echoes of his Ronchamp chapel (note distinctive openings in model at left) but is otherwise unique—in fact special construction methods had to be thought up on the spot to translate Le Corbusier's delicate working drawings (left, above) into reality.

COURTESY "BOUW"



UNDERGROUND IN HOLLAND

Last September Netherlanders celebrated the opening of the mile-long Velser Tunnel which connects Amsterdam with the northwestern part of the country. When it came to ventilating the tunnel, Architects Roosenburg, Verhave, Luyt, & De Iongh produced a design of four tall exhaust chimneys and an equal number of shorter intake pipes that is as fascinating as it is functional. Looking like a crop of aggressive vegetables, the towers cluster menacingly around their operations building.

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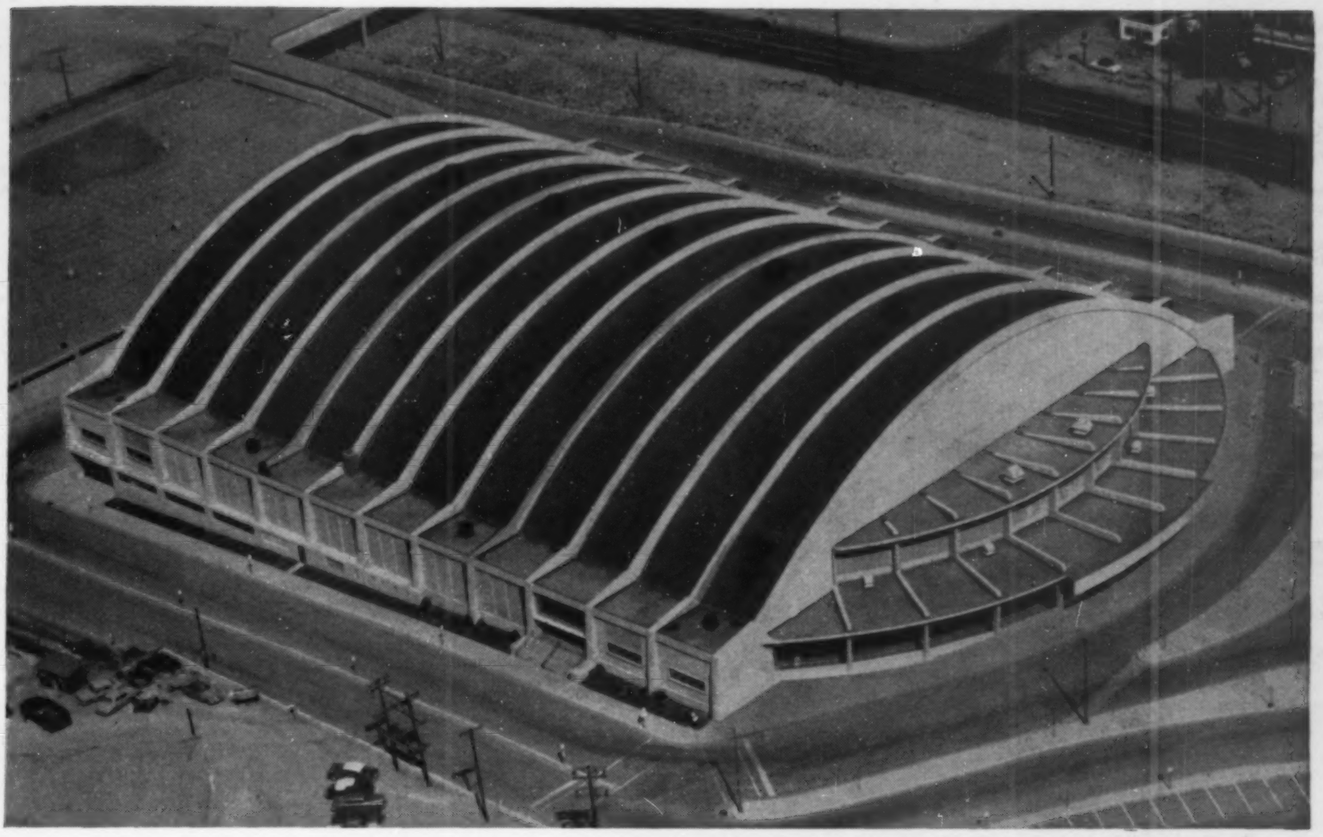

Denver's Coliseum...

Illustrates Versatility of Concrete for Arena Buildings

Denver's Coliseum is a handsome example of the functional use of concrete for arenas requiring uninterrupted enclosed space with minimum maintenance. Its arched construction requires no supporting pillars and provides a clear and unobstructed view of the entire arena area. Only concrete, the completely plastic building material, can be so molded and formed into any shape with all of its strengthening reinforcement inside.

Throughout the long years of its life, this concrete building will be virtually maintenance-free—a joy both to taxpayers and to spectators who attend the public functions held therein.

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DENVER, COLORADO

15 Plants and 4 Terminals Serving Some of the Most Rapidly Growing Areas of the Nation

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NEW YORK'S COLISEUM—

The building that "has everything" has heating and air-conditioning systems of

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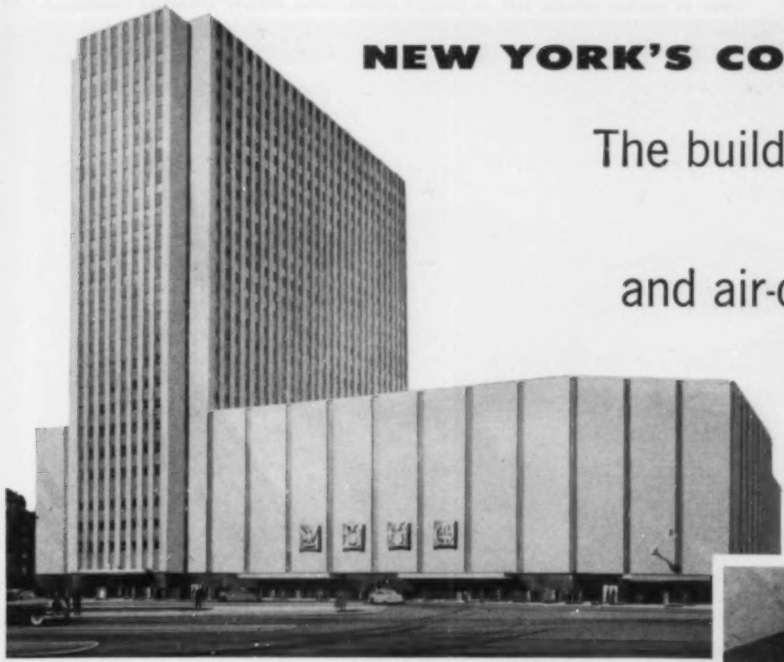

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CONSULTING ARCHITECTS: Eggers & Higgins, John B. Peterkin, Aymar Embury III
GENERAL CONTRACTOR: Walsh-Fuller-Slattery
HEATING & AIR CONDITIONING: Almirall & Company, Inc.
MECHANICAL & ELECTRICAL ENGINEERS: Guy B. Panero Associates
STRUCTURAL ENGINEER: Dr. Jacob Feld

New York City's Coliseum is one of the most distinctive and functional structures ever conceived. Its 26 floors and giant exhibition hall comprise an auditorium area capable of seating over 10,000 persons, approximately 1,000,000 sq. ft. of usable floor space, and an 850-car underground garage. Except for the garage, the building is completely air conditioned.

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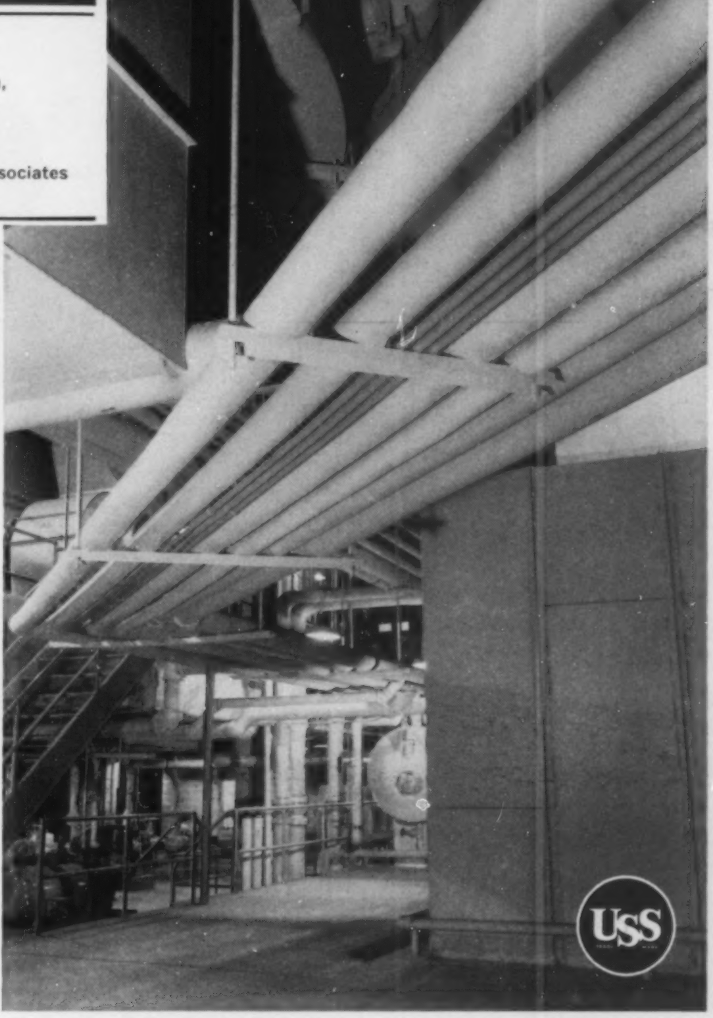

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Footnote*

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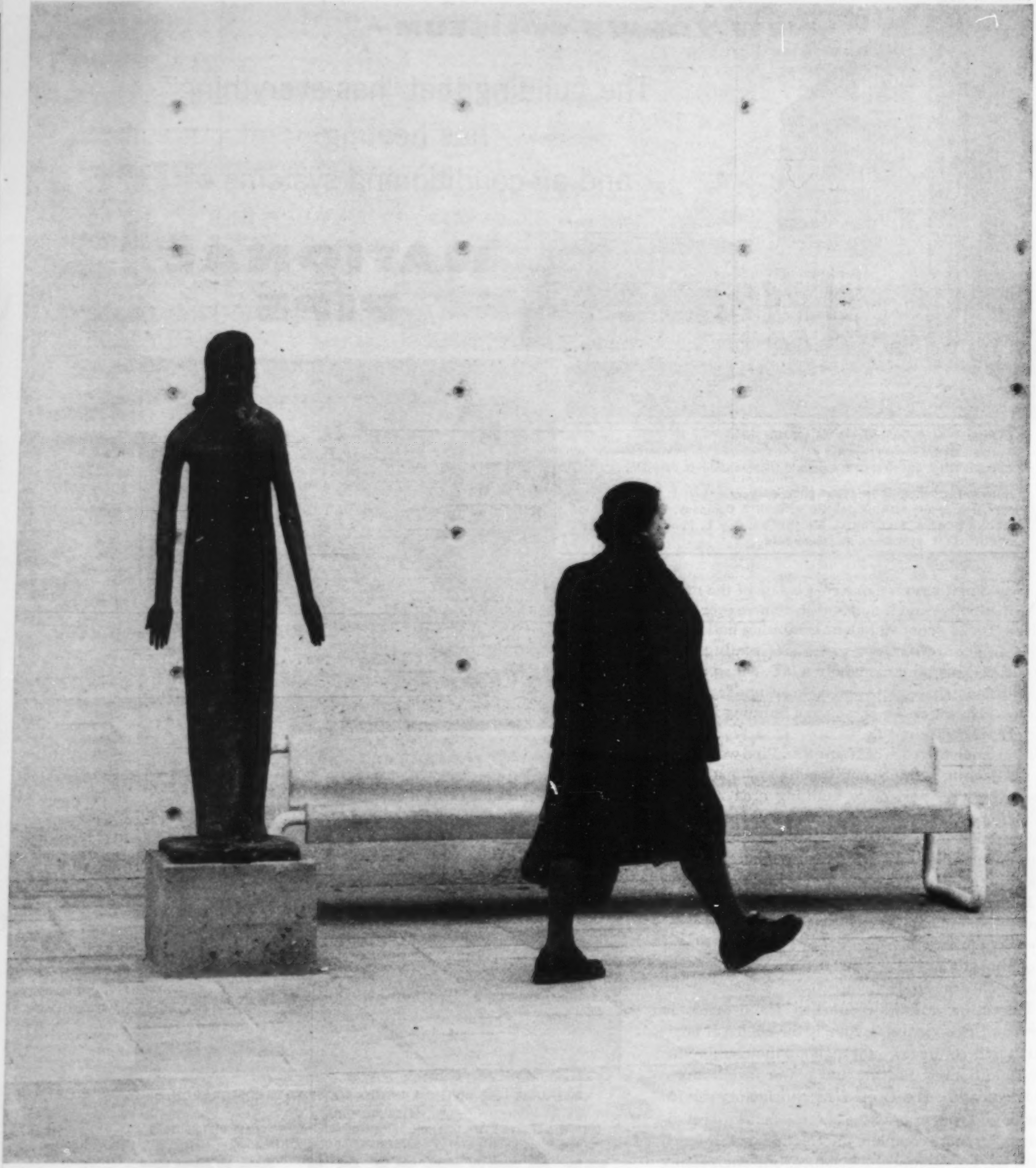

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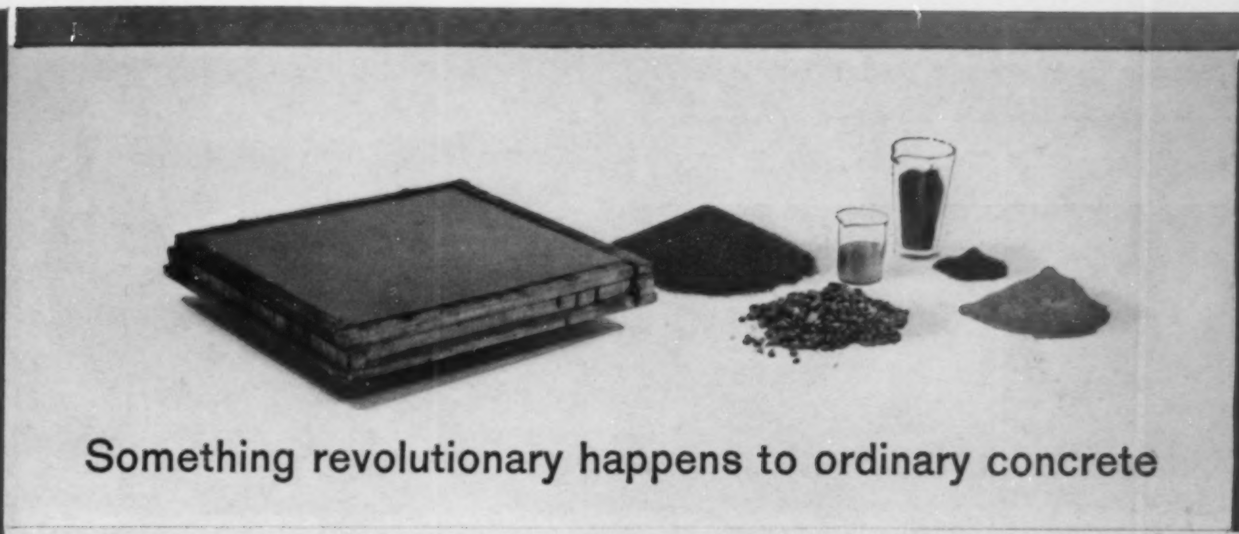
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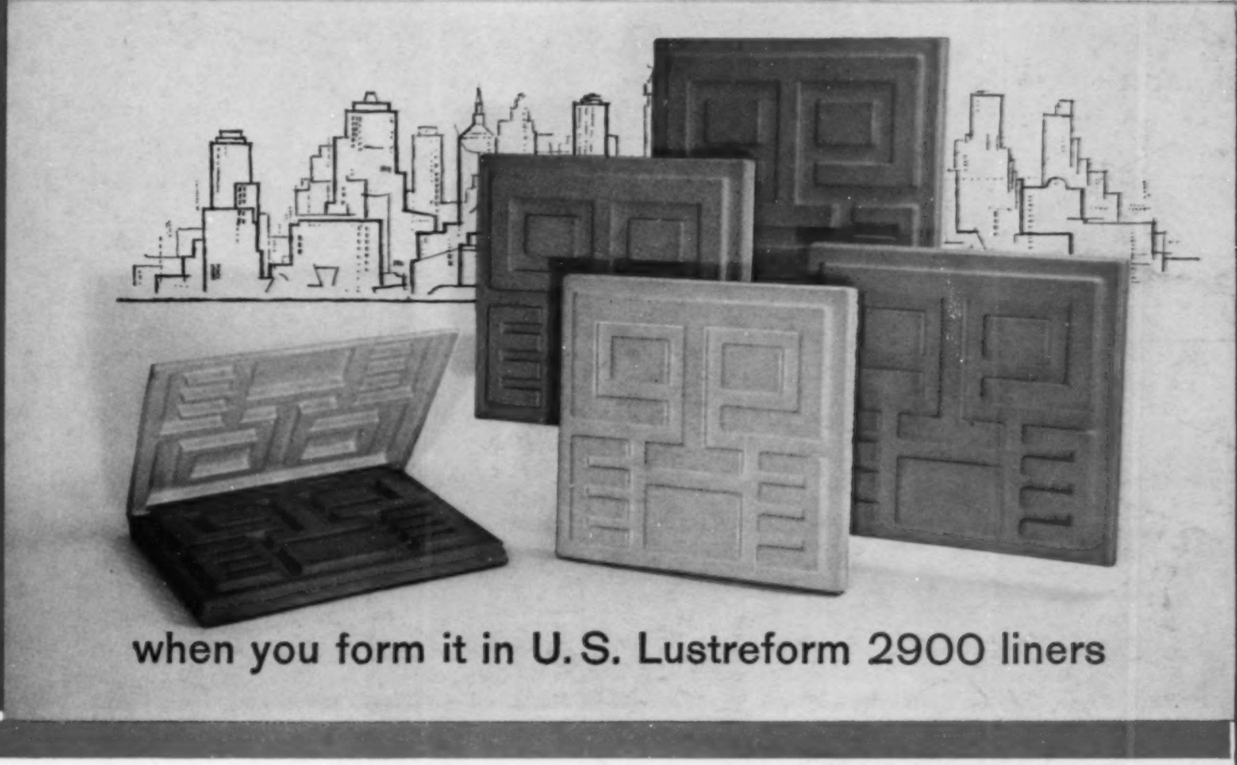
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